ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR

September 2006

Responsiveness Summary for Public Questions and Comments on the Construction Permit Application from Marquis Energy, LLC for an Ethanol Plant in Hennepin, Illinois

Site Identification No.: 155010AAJ
Application No.: 06020041

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INTRODUCTION

Marquis Energy, LLC has applied for an air pollution control construction permit to build a fuel ethanol production plant to be located at 11953 ESK Road in Hennepin.

Upon review of comments received during the public comment period and final review of the application, the Illinois Environmental Protection Agency (Illinois EPA) has determined that the application meets the standards for issuance of a construction permit. Accordingly, on September 28, 2006, simultaneously with the issuance of this Responsiveness Summary, the Illinois EPA issued a permit to Marquis to construct the proposed plant. The plant must be constructed and operated in accordance with applicable regulations and the terms and conditions of the issued permit.

The issued permit includes a number of additional requirements for the proposed plant compared to the draft permit, as well as various clarifications to conditions, based on public comments. In particular, the issued permit contains additional limitations on certain operations at the proposed plant and additional requirements for emissions testing, monitoring and recordkeeping to assure that the proposed plant would not be a major source of emissions under the federal rules for Prevention of Signification Deterioration (PSD), 40 CFR 52.21.

DESCRIPTION OF PROPOSED PLANT

Marquis Energy has proposed to construct a plant to produce ethanol from corn. The plant would be designed to have a nominal capacity of 100 million gallon per year, with the ability to actually produce up to 110 million gallons of ethanol per year. The denatured ethanol produced by the plant would be used as motor vehicle fuel. When added to gasoline, ethanol is an octane enhancer and oxygenated fuel additive, which reduces hydrocarbon and carbon monoxide emissions in vehicle exhaust. The plant would produce ethanol by batch fermentation of ground corn, followed by processing to separate out and purify the ethanol. The plant would also produce animal feed from the stillage material remaining after the fermentation process. The plant would have facilities to receive raw material (grain) and ship products (fuel ethanol and feed) by both truck and rail. Natural gas would be used as the fuel for the plant.

COMMENT PERIOD AND PUBLIC HEARING

The Illinois EPA Bureau of Air evaluates applications and issues permits for sources of emissions. An air pollution control permit application must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued. Following its initial technical review of Marquis's application, the Illinois EPA Bureau of Air made a preliminary determination that the application for the proposed plant met the standards for issuance of a construction permit and prepared a draft permit for public review and comment.

The public comment period began on June 14, 2006, with the publication of a notice in the Putnam County Record on June 14, 2006. The notice was also published in the Putnam County Record on June 21 and 28, 2006.

A public hearing was held on August 1, 2006, at the Putnam County High School to receive oral comments and answer questions regarding the application and draft air permit. The comment period closed on August 31, 2006.

AVAILABILITY OF DOCUMENTS

The permit issued to Marquis and this responsiveness summary are available on the Illinois Permit Database at www.epa.gov/region5/air/permits/ilonline.htm (please look for the documents under All Permit Records (sorted by name), State Construction Permits). Copies of these documents may also be obtained by contacting the Illinois EPA at the telephone numbers listed at the end of this document.

GENERAL COMMENTS WITH RESPONSES BY THE ILLINOIS EPA

1. Will the emissions of the proposed plant conform with federal and state standards?

The purpose of the Illinois EPA's review of the application is to determine if the proposed plant, as generally described in the application, will be able to conform to applicable state and federal regulations. The Illinois EPA, after review of the application and public comments, has determined that the proposed plant is being developed to comply with applicable regulations. The plant after being built must be tested to make sure that the equipment, as installed, complies with applicable regulations and emission limits established in the permit.

2. I'm very concerned about emissions and I'm very concerned about the smell from the proposed plant.

The emissions from the proposed plant will be well controlled using equipment that is now standard in the fuel ethanol industry. This control equipment, which includes a scrubber for the fermenters and thermal oxidizers for the distillation units and feed dryers, will also control emissions of odors from the plant.

3. I am particularly concerned about the carbon monoxide (CO) emissions from the proposed plant. The applicable state rules allow the boilers to emit up to 200 ppm CO, which is a high level that can cause headaches, fatigue and nausea.

The state rules for emissions from boilers limit the concentration of CO in the exhaust from the boilers, as determined at the stack. The state and federal rules for CO air quality in the outdoor air at ground level, which are set to protect public health and welfare and address the air that people actually breathe, limit the concentration of CO in the ambient air to no more than 35 ppm on a 1-hour average and 9-ppm on an 8-hour average. The ambient air quality in Illinois meets these standards. For example, in 2004, the highest CO concentrations measured by the Illinois EPA in any hour were 5.0 ppm, measured in highly

urbanized East St. Louis and Cicero. Boilers at industrial plants, like the boilers at the proposed plant, do not pose a concern for CO air quality due to their elevated stacks

4. There are no specific rules that apply to ethanol production plants.

There are various emission standards that apply to many of the emission units at ethanol plants, as units such as grain handling, distillation, drying, and boilers are present at many plants. In addition, the federal rules for Prevention of Significant Deterioration (PSD), which the Illinois EPA administers in Illinois for USEPA, act to constrain the overall emissions of the new fuel ethanol plants being proposed in Illinois.

5. Other states, including the nearby states of Indiana and Ohio, have more stringent standards for fuel ethanol plants than Illinois.

Ethanol plants being developed in Illinois are required to use scrubbers and oxidizers or other combustion-type equipment to control emissions. To this extent, the proposed Marquis ethanol plant would be controlled by scrubbers and oxidizers to assure that the plant would comply with all applicable state and federal emission standards. Furthermore, these requirements for scrubbers and oxidizers to control emissions from ethanol plants are consistent with requirements placed on new ethanol plants in other states.

6. Why doesn't the Illinois EPA adopt the federal standards and make plants comply with the federal standards?

The State of Illinois has adopted federal emissions standards and other federal regulations, which the Illinois EPA administers in Illinois for the USEPA under a delegation agreement. However, as certain federal standards and regulations only apply to major sources of emissions and the proposed plant is being developed so that it will not be a major source, those particular federal standards are not applicable to the proposed plant

7. Illinois does not require Best Available Control Technology (BACT).

BACT is a requirement of the federal PSD rules. The BACT requirement of the PSD rules applies to <u>major</u> projects, i.e., new major sources and major modifications at existing major sources. The proposed plant is being developed so that it will be a minor source for purposes of the PSD rules.

Even though the proposed plant is not subject to BACT, the permit does include requirements that control devices be operated for effective control of emissions, separate and apart from requirements in the permit that limit emissions of the proposed plant so that it is not a major source.

8. The Illinois EPA has issued a guide, available on its website, for building an new ethanol plant in Illinois. The first thing that the guide mentions is that a construction permit is required and that it will presumably be a PSD permit that will be required.

This guide, which was jointly prepared by the Illinois EPA and the Illinois Department of Commerce and Economic Opportunity, does not presume that a proposed ethanol plant will require a PSD permit. While this guide does describe the requirements that must be met if a proposed plant exceeds the major source thresholds, it also recognizes that most new ethanol plants are being developed to stay below the major source thresholds, so as to avoid the additional time and addition requirements for permitting a major source. In this regard, the guide states, "Major sources of air pollution…are subject to more stringent and complex air pollution control requirements. As a result, ethanol plants in Illinois have attempted to keep emissions below these thresholds."

9. The draft permit does not address the grain elevator that would be adjacent to the proposed plant and work in conjunction with the plant. If the grain elevator is considered, the emissions of the proposed plant may well trigger major review under the PSD rules.

The grain elevator that is part of the proposed plant is addressed in the draft permit, with operating requirements and emission limits established for operations at the elevator.

10. Has the Illinois EPA considered all of the particulate emissions, including fugitive dust emissions, in setting the permit limits on emissions? If not, fugitive dust emissions could put the plant's emissions over the major source threshold.

The permit addresses all particulate emissions from the proposed plant, including fugitive dust emissions.

11. The emission limits in the draft permit are extremely close to the major source thresholds under the PSD rules.

This is correct. However, Marquis has conservatively applied for emission limits that generally reflect the emission guarantees that it has obtained for the proposed plant. It is expected that the actual emissions of the plant would be below these numbers. As an example, as stated in other comments, thermal oxidizers can achieve higher efficiencies in practice than the minimum efficiency required by the permit and higher efficiencies in practice would lower actual emissions from the plant.

12. There are serious problems with the determination of potential emissions for a number of operations at the proposed plant, as addressed in separate detailed comments. If the potential emissions of the proposed plant for any criteria pollutant are 100 tons per year or more, a permit may not be issued since the proposed plant has not undergone review under the federal PSD rules, as is required for a proposed major source.

    This is a critical issue because the margins between the permitted emissions for the proposed plant and the 100 ton/year major source threshold are very small for most pollutants. Based on the summary of emissions in Table 1 of the draft permit, these margins are 1.45, 1.85, 3.13 and 3.45 tons per year for volatile organic material (VOM), particulate matter (PM), carbon monoxide (CO) and nitrogen oxides (NOX), respectively. The detailed comments for certain units at the proposed plant show that the potential emissions of those units have been underestimated. When these underestimates are

considered, it is clear that the proposed plant will be a major source for certain pollutants. In addition, for the specific units for which emissions have been underestimated, these emission calculations constitute errors in the application.

In the issued permit, the "margins" between the permitted emissions of the plant and the 100 ton/year major threshold source are all at least 2.0 tons. This is an adequate margin given the nature of the underlying emissions calculations and the provisions of the permit that act to ensure that the proposed plant will not be a major source of emissions. The various comments on specific operations do not identify fundamental flaws in the evaluation of the emissions of the proposed plant, whose correction results in the proposed plant being a major source.

13. When the permitted emissions are this close to the major source thresholds, greater scrutiny and greater monitoring should be required of a plant.

This commonsense principle is implemented in the conditions of the permit. The operational requirements on emissions and operation of the proposed plant, as well as the associated requirements for emission testing, monitoring, and recordkeeping, are much more rigorous than the requirements in permits for plants with less capacity, for which there is a greater margin from the major source thresholds.

14. The Illinois EPA spokesman at the hearing said that the plant would meet BACT. A BACT analysis has not been done for this project so this not an accurate statement.

This is correct. The Illinois EPA has not performed a BACT analysis for operations at the proposed plant so there has not been a determination that the performance requirements in the permit for different operations are BACT. However, the control equipment that would be used at the proposed plant is the same as used at other recently permitted plants, so it is accurate to say that this control equipment, possibly with tighter emission limits, is the equipment that would be required as BACT control technology.

15. The fermentation scrubber is only being permitted to require 98 percent control efficiency for VOM. Several other scrubbers around the country have been permitted at greater efficiency, such as United Wisconsin Grain Producers in Wisconsin at 98.7%; Al-Corn in Minnesota at 99.2%; and Central Minnesota Ethanol Cooperative in Minnesota at 99%.

The control efficiency requirement for the fermentation scrubber at the proposed plant is similar to the control requirement for United Wisconsin Grain Producers. In particular, the permit requires that the fermentation scrubber undergo further improvement if initial emissions testing does not demonstrate compliance with applicable VOM limits by a margin of at least 20%. The Illinois EPA has not been able to confirm the control efficiencies of the fermentation scrubbers at other plants reported by this comment. In any case, the proposed plant is not a major source and the performance requirements for scrubber efficiency was not established based on a project-specific BACT analysis. Nevertheless, the plant will have the same technology that these other ethanol plants are using. The control efficiency requirement in the permit requires that the scrubber be

operated effectively and it can be expected that scrubber will achieve similar efficiencies as scrubbers at other new ethanol plants.

16. The Illinois EPA has not considered the cumulative impact that the proposed plant, combined with other sources already in the area, will have on ambient air quality.

The proposed plant is located in a rural attainment area for all criteria air pollutants. In Illinois' rural attainment areas, the construction of a new minor source does not pose a concern for its impact on ambient air quality. This is the case for the proposed plant even with the industrial sources that are already present in Putnam County, including Exolon-ESK, Dynegy's Hennepin power plant, and ISG's Hennepin steel works. Formal modeling is not a requirement for issuance of permits for minor projects. Even in the case of a major project, modeling of surrounding sources in addition to the project in question only occurs if initial modeling of a proposed project shows that the project's air quality impacts will be above a de minimis level set under the PSD rules.

17. Marquis Energy spokesmen have been quoted stating that a 200 million gallon per year plant will be built in two phases. A press release was issued in April 2006 announcing that Marquis already had an agreement in place for the financing and construction of a 200 million gallon year plant. Marquis has also stated that it is planning to convert the plant to burning coal as soon as it is built. This indicates that Marquis is currently applying for only part of the plant that it intends to build, so that it can begin construction more quickly. Accordingly Marquis has improperly applied for a "sham permit."

    As addressed by USEPA policy, sham permitting occurs when a source pursues a permit for a proposed project that limits the project's emissions to minor source levels as a means of inappropriately circumventing (or delaying) the requirements that would otherwise apply to the project if it were major. This is most often attempted when a source wants to expedite construction of a proposed project, so it proposes limits on the project's emissions, which it considers temporary, such that the project is not required to undergo the more time consuming and potentially more rigorous permitting required for a major project. For example, a public comment period is mandatory for a major project and the effectiveness of an issued permit can be delayed by an appeal. When a source engages in sham permitting, its real intent is to obtain a revised construction permit for the project without the constraining limits prior to beginning normal operation or shortly thereafter. The USEPA has stated that sham permitting is improper, as permit applicants should fully address the true scope of proposed projects when they initially apply for construction permits.

Because of certain public statements made about Marquis' plans, the Illinois EPA has investigated whether Marquis is attempting to obtain a sham permit. These investigations indicate that Marquis is not engaging in sham permitting. First, the application before the Illinois EPA at this time reflects Marquis' current plans for the site. While Marquis may have some long term aspirations or goals, as reported in these comments, these hopes of future expansion do not mean that Marquis is engaging in sham permitting. Second, the application and permit for the proposed plant are consistent with development of a nominal 100 million gallon per year plant (which might in actual practice be able to

produce 110 million gallons per year). Neither the application nor the permit address the additional fermentation capacity, dryers, boilers and other equipment that would need to be constructed for a plant with twice that nominal capacity. Finally, sham permitting would put the proposed plant at significant financial risk, as Marquis would be subject to enforcement for construction without a valid permit.

18. If Marquis wants to expand or switch to coal, would it have to obtain another construction permit from the Illinois EPA?

Yes. Marquis would have to obtain a new construction permit from the Illinois EPA prior to undertaking either of these projects. Give the additional emissions that would accompany burning of coal, as compared to natural gas, even with the use of modern emission control technology, an application to install coal-fired boilers at the proposed plant and convert to coal fuel would almost certainly be a major project subject to the Best Available Control Technology (BACT) requirement of the federal PSD rules.

19. Can the construction permit contain a condition that says that there shall be no odor?

While the permit cannot include a condition that says that there shall be no odor, the permit does include conditions that will act to minimize odors from the plant. The permit also does not excuse Marquis from the obligation to undertake actions to eliminate a public nuisance due to odors from the plant.

20. The Illinois EPA should not take at face value what Marquis says that the plant will emit.

The permit for the proposed plant requires emissions testing to be performed for significant emission units prior to the issuance of an operating permit to assure that the plant is operating within the limits established by the construction permit.

21. Who will perform emission testing at the plant, Marquis Energy or the Illinois EPA?

Marquis is required to hire an independent testing service to perform emission testing. Prior to testing a testing plan must be submitted to the Illinois EPA for review. Illinois EPA personnel will be present during testing to observe both the execution of the testing and the operation of the plant during testing.

22. What measures are in place to monitor the plant to make sure that it will not exceed the major source thresholds?

A variety of measures are imposed on the various units at the plants to ensure that emissions of different pollutants do not exceed the applicable major source thresholds. As discussed above, emission testing must be conduced on significant units at the plant after construction to verify that emissions at maximum throughput and normal operating conditions will be within the limits established by the permit. Units must also be promptly retested upon written request by the Illinois EPA. NOx continuous emission monitoring is required for the boilers. Additional emissions monitoring is required for certain units unless emission testing shows that the units normally comply with the applicable limit by a

specified margin. A variety of operational monitoring is required for the control equipment at the plant to verify proper operation. Marquis will also have to keep operating records that will allow Marquis and the Illinois EPA to verify whether the plant is operating in compliance and identify any period when a unit may be exceeding applicable emission limits or other requirements.

23. Will the plant be inspected?

Yes. The Illinois EPA's field office in LaSalle currently has primary responsibility for inspecting sources in Putnam County. Inspections are usually performed about every two years but are more frequent when required to address a particular source. Inspections are also routinely made in response to public complaints about a source.

24. The Illinois EPA should not rely of the Marquis' records and reporting to make sure that the plant is in compliance?

Marquis Energy would operate the plant and be responsible for maintaining operating records. While it would be impossible for Illinois EPA personnel to be present at the plant on a continual basis, the Illinois EPA does perform inspections and the plant must submit reports to the Illinois EPA, which are reviewed. Falsification of records or reports can carry stiff penalties, including criminal prosecution.

25. The wastewater settling ponds will create emission issues. Are they addressed in the permit?

The retention ponds at ethanol plants have not been identified as a source of emissions. Water itself is not an air pollutant and water evaporating from settling ponds is not regulated by the permit.

26. How will wastewater be handled at the plant? Will the plant discharge wastewater? Does Marquis need to get a permit for this?

Marquis has explained that the proposed plant is being designed so that process wastewater would be reused at the plant, so that there would not be a discharge of process wastewater. In general terms, process wastewater recovered from units at the back of the plant would be returned to the units at the front end of the plant. Separate from process wastewater, the proposed plant will have a discharge of non-contact water from the cooling tower, for which Marquis will have to obtain an appropriate wastewater discharge permit from the Illinois EPA. This wastewater stream will be managed to maintain the level of dissolved solids within the limits set by the wastewater permit.

27. How deep would the wells be that supply fresh water to the plant? What assurance do local residents have that the plant will not affect the town's wells or, if it does, that the Illinois EPA will help the town correct the problem?

Marquis has stated that water for the plant would come from wells sunk to about 250 ft. Given the magnitude of water resources in the Illinois River Valley, the proposed plant should not have any affect on Hennepin's public water supply.

28. There are no siting requirements in Illinois to address ethanol plants.

Proposed ethanol plants, like other industrial land uses, are subject to appropriate zoning and land use planning, which are the responsibility of and administered by local governmental authorities.

29. Would the permit regulate light pollution? How is light pollution regulated?

Lighting and light pollution are matters that are the responsibility of local governmental authorities.

30. Would there be fines or other consequences if there are nuisance odors from the plant? In Lena, a citizens group had to sue Adkins Energy before the State intervened to take action against that fuel ethanol plant.

If there are nuisance odors from the plant, the Illinois EPA would take action to ensure that the plant was taking appropriate steps to eliminate such odors. After Adkins Energy began operation in the summer of 2002, the Illinois EPA took action based on citizen complaints about the odor and inspections of the plant by Illinois EPA personnel, which determined that the control technology proposed and built at the site did not adequately control emissions. Adkins was required to install a thermal oxidizer at the plant to appropriately control emissions from the feed dryer and distillation operations. A group of local citizen also decided to take legal action against the plant after the Illinois EPA had begun its investigation and enforcement actions against the plant.

31. I don't want our area to be another Lena.

The original feed dryer at the Adkins ethanol plant was not equipped with a thermal oxidizer. Instead, dryer was designed to control organic emissions, including odors, by recirculating most of the exhaust from the dryer back through the burner and furnace at the front of the dryer. This design was not effective in controlling emissions and an enforcement action ensued that led to a consent decree with Adkins. Under the decree, Adkins agreed to install a oxidizer to control the feed dryer. The Illinois EPA receives far fewer complaints about the plant since the installation of this oxidizer.

32. What should I do if I am bothered by odors from the Marquis plant?

If you are bothered by odors from the plant, you should inform the Illinois EPA. It is important that the Illinois EPA be notified of problem odors so that it can investigate, to determine the cause of the problem, the actions being taken by the plant, and an appropriate response by the Illinois EPA.

You may also wish to directly contact the plant. In particular, if odors are due to a malfunction or upset, the plant may be able to provide an immediate explanation of what has happened. A call to the plant can also allow plant personnel to initiate their investigation during the period when odors are being experienced, rather than attempting a more challenging after the fact investigation hours or days later.

33. If the proposed plant exceeds the major source thresholds, there is not much that the Illinois EPA can do to correct the problem. It is highly unlikely that Marquis would be required to engage in a PSD review for the plant.

If the plant were to operate with emissions above the major source threshold, Marquis would be required to undergo PSD review for the plant. Retroactive PSD review has been required for projects that have failed to maintain emissions within the levels necessary to qualify as a minor project. However, given the various control measures that are present on the proposed plant, it is possible that PSD review would not result in any significant changes to the control requirements for the plant. PSD review could even act to increase emissions of the plant, as the plant would be allowed to operate as a major source.

34. Once the ethanol plant is constructed and operating, the Illinois EPA will not shut the plant down even if there are problems.

Resolution of noncompliance and enforcement actions taken by the Illinois EPA and the Attorney General's office, which acts as the Illinois EPA's attorney if an enforcement action proceeds to litigation, is determined by the severity of the violation. It is true that the Illinois EPA first looks to resolve an enforcement action by correcting the problem at the plant. However, in the event that a plant's operations pose an immediate and direct threat to public health, the Illinois EPA would seek a court injunction to shut down the plant. In the case, of Adkins Energy, the plant operated for approximately a year without a feed dryer, selling all of its feed production as wet cake, rather than dry feed, at great inconvenience and significant loss of revenue to the company.

35. Marquis started construction of the plant before receiving its permit.

The local Illinois EPA inspector has been to the plant site a number of times to investigate reports from the public that Marquis had begun construction of the proposed plant. These inspections did not find that Marquis had begun activities at the site that would constitute construction of the proposed plant. The activities occurring at the site were of a general nature, e.g., clearing of property and development of access roadways, that do not constitute commencement of construction under applicable regulations.

COMMENTS ON THE DRAFT PERMIT WITH RESPONSES BY THE ILLINOIS EPA

General Comments on the Draft Permit

36. The draft permit would allow the proposed plant to process up to 40 million bushels of grain per year (Condition 1.1(a)). However, the emission calculations in the application

are based on processing 1.1 million tons of corn, which is equivalent to only 39.3 million bushels. The 40 million bushel limit in the draft permit is 1.8% higher than a fundamental element of the emission calculations for the plant. Either the permit should limit the annual grain input to no more than 1.1 million tons or Marquis should submit revised emission calculations to account for processing 40 million bushels of grain per year.

The issued permit limits the amount of grain processed by the plant to 1.1 million tons, as recommended by this comment.

37. The determination whether the proposed plant is minor for particulate matter (PM) under the PSD rules must consider both filterable and condensible PM emissions, since both contribute to particulate emissions, as addressed by the PSD rules. Recent tests at the VeraSun ethanol plant in Fort Dodge, Iowa show that when grain handling and milling are controlled with baghouses, condensible PM constitutes the majority of PM emissions from the operations. The provisions of the permit for emission testing should require condensible PM emission determinations for the baghouses controlling the grain handling and milling operations.

The issued permit requires that all emission testing for PM also include measurements of condensible PM. This step was taken to assure that all PM emissions testing fully quantifies PM emissions, even though the emissions of condensible PM from grain handling and milling operations are expected to very small and should not impact compliance determinations, as confirmed by the measurements at the VeraSun plant. Condensible PM emissions from these operations also will not affect the determination that the proposed plant is not a major source. This is because condensible PM is a component of particulate matter$_{10}$ (PM-10) but not total suspended particulate (TSP), as generally addressed by the permit. The permitted PM-10 emissions of the proposed plant are less than 85 tons/year, compared to the major source threshold of 100 tons/year.

38. The provisions of the draft permit for emission testing for VOM and HAPs provide that "Testing shall be conducted in accordance with industry-specific guidance from USEPA on testing VOM and HAP emissions at ethanol plants." This is an indeterminate qualification on the testing requirement. The permit should cite a particular USEPA guidance document published on a specific date and the effect of such document on compliance with VOM emission limits. Language should be included in the permit to clarify that all measurements by USEPA Method 25/25A should be subject to USEPA's current scalar factor (a multiplier of 2.2), with that value compared against the applicable VOM emission limits. The permit should also provide that USEPA Method 18 measurements of VOM in terms of specific compounds or a USEPA Method 25/25A measurement as adjusted by the scalar factor of 2.2, whichever is larger, can be used to enforce the permit's VOM emission limits.

The provisions in the permit are appropriate. Because USEPA may continue to evaluate and refine its guidance for testing of VOM emissions at ethanol plants and other grain processing plants, it is not possible for the permit to refer to a particular version of USEPA's guidance. The general effect of this USEPA guidance is also clear, as it requires VOM test results to be properly "adjusted" to accurately reflect the actual mass of VOM

emissions. The issued permit does include additional language referring to the default scalar factor in current USEPA guidance, 2.2, so that this factor is readily understood. However, this scalar factor cannot be imposed on a continuing basis, as relevant USEPA guidance on this topic may continue to develop. Finally, it is not necessary for the permit to state that compliance with VOM emission limits expressed in pounds or tons shall be based on the actual mass of a pollutant that is emitted, as that is the manner in which VOM limits are generally established and enforced.

39. Measurements of emissions by USEPA Method 18 should be required to address at least 20 specific organic compounds, including acetaldehyde, acetic acid, ethanol, formaldehyde, formic acid, furaldehyde, methanol, glycerol, lactic acid, butanol, acrolein, isoamyl alcohol, ethyl acetate, succinic acid and isoamyl acetate.

While emission measurements for many of the compounds listed in this comments will be made as part of VOM emission testing, the extent of such testing is a matter that is appropriately resolved shortly before testing, as part of the approval of a test plan by the Illinois EPA. As explained above, USEPA guidance for testing of organic emissions at fuel ethanol plants may still evolve.

Emergency Engine (Condition 2.2)

40. For the 300 hp diesel engine-generator for the emergency firewater pump, the emission factors used in the application are significantly lower than the factors published by USEPA for small, uncontrolled diesel engine (*Compilation of Air Pollutant Emission Factors*, USEPA, AP-42). The factors in the application are 53%, 37%, 12%, 9.1% and 9% of the USEPA's emission factors for SO2, NOx, VOM, CO and PM, respectively. Although the permit application indicates that it is based on the manufacturer's emission factors, no supporting information e.g., manufacturer guarantees or product literature, was provided.

The emission factors used in the application are reasonable for a new diesel engine. Given the improvements that have occurred in diesel engine technology in recent years, it is not appropriate to use the information in AP-42, which addresses existing engines and is 10 years old, as a basis to assess the adequacy of the emission calculations for the emergency engine.

41. The permit application is incomplete because it does not contain information to support the claimed emission control performance. The application's emission calculations should not be approved unless and until it is supplemented by specific vendor guarantee information and information about engine emission controls, if any.

The information in the application is sufficient, when one considers that the engine is an <u>emergency</u> engine and its emission have been conservatively estimated. If adjustments to the emission limits for the engine are needed as further detailed data becomes available, the limits can be readily adjusted by lowering the permitted operation of the engine. This is because the emission calculations are based on operation for up to 300 hours per year, as

limited by the permit. This far exceeds the actual level of operation expected of the engine, which could be less than an hour each month.

42. The application does not provide information on any emission control equipment that is intended to be installed on the engine. It appears likely that control equipment or adjustments to engine operation will be necessary to meet the emission rates claimed in the application. If the performance of the emergency engine depends on the use of emission control devices, such as trap oxidizers, then additional monitoring and recordkeeping provisions should be included in the permit to ensure that such devices are properly operating.

Add-on control equipment or engine adjustments, as addressed in this comment, are not routinely used on small emergency engines. Due to the limited usage of these engines and the need for simple, reliable operation, these engines are usually the basic low-emission engines available from manufacturers.

43. The fuel tank associated with the emergency engine and its emissions are missing from the application for the proposed plant.

The fuel tank for the emergency engine does not require a permit. It will also be a trivial source of VOM emissions.

Grain Handling and Milling (Condition 2.3)

44. The application does not include technical details for the design of the grain receiving area or the associated fugitive emissions collection system, including the effective grate area of the dump-pit and the amount of aspiration air. This is unacceptable because it is not possible to know if the design of these systems will properly and effectively collect fugitive emissions.

Grain receiving operations at new elevators can be readily designed and constructed to control PM emissions. The permit requires that the PM emissions from grain receiving at the proposed plant not exceed 5 percent opacity. This sets the "specifications" for control of PM emissions from the grain handling operations, which the operations and associated control devices must be designed, constructed and operated to meet. Even if the design of the proposed operation had been completed and details of the design submitted in the application, review of that design data for the operation would not excuse Marquis from complying with the performance specification for the operation established in the permit.

45. The baghouse for grain handling operations, which has a capacity of 48,000 SCFM, serves other grain handling operations beside the receiving area. The application does not contain information on the amount of aspiration air to each operation or information on baffles and other control measures on each operation. Without this information, one cannot ensure that the system is designed to provide 95% collection efficiency, as relied upon in calculating PM emissions. Any increase in the size of the baghouse to assure effective control of emissions or failure of the fugitive emission collection system to properly function would threaten to push the plant's PM emissions over the major source

threshold. The application should be considered incomplete until these details for the design of the control system are provided.

As explained above, the grain handling operations can be readily designed to achieve effective control of fugitive PM emissions. The receiving of grain at the proposed plant is the only operation for which such emissions pose any particular concern. Once grain has been received, operations can be readily enclosed so as to allow effective capture of PM emissions. Marquis has indicated that the data for the capacity of the baghouse for grain handling operations provided in the application, 48,000 SCFM, was conservatively developed, so that it is more likely that the actual size of the baghouse would be smaller, rather than larger.

46. The application must be revised to consider condensible PM emissions from the grain handling and milling operations at the proposed plant. In PM emissions testing conducted at VeraSun in Fort Dodge, Iowa, a 110 million gallon/year fuel ethanol plant, it was found that condensible PM constitutes most of the PM emissions from both the milling and grain handling operations. Emissions of condensible PM, as measured by USEPA Method 202, were 0.132 and 0.069 lb/hr from the baghouses for grain handling and milling, respectively. Assuming continuous operation, the condensible PM emissions from these two operations at the VeraSun plant would be 0.88 tons/yr.

The data provided in this comments confirms the conservative nature of the PM emissions calculations in the application for the proposed plant. It does not demonstrate a need for changes to the application or the permit. This is because the comment cites data showing actual PM emissions of at most 1.8 tons/yr, total, from the baghouses for grain handling and milling at the 110 million gallon/yr VeraSun plant. The permit for the proposed plant conservatively accounts for and allows PM emissions of up to 14.3 tons/yr from these units.

47. The requirements of 35 IAC 212.462 should apply to the grain handling operations at the proposed plant, i.e., Condition 2.3.5(b) should not be included in the permit. This condition in the draft permit provides that an individual grain handling operation need only comply with applicable requirements of 35 IAC 212.462 if a certified investigation performed by the Illinois EPA determines that the operation is causing or tending to cause air pollution. This condition makes grain handling operations at the plant conditionally exempt from the requirements of 35 IAC 212.462, with applicability only triggered if the Illinois EPA finds that an operation is causing air pollution.

    The grain handling operations are not entitled to this exemption because another criterion for this exemption will not be met. The relevant portion of Section 9(f) of the Environmental Protection Act (which is the legal basis for this provision), also provides that a criterion for exemption is that a grain elevator not be required to obtain a Clean Air Act Permit Program permit pursuant to Section 39.5 of the Act. Since the proposed plant will be required to obtain a Clean Air Act Permit Program permit pursuant to Section 39.5 of the Act, due to the applicability of certain New Source Performance Standards (NSPS) to certain units, the plant is not entitled to this exemption. The elevator is also not entitled to this exemption because it would be a new elevator under 35 IAC 212.462(e), with an annual grain throughput over 300,000 bushels. Further, the

elevator does not qualify for an exemption under 35 IAC 212.462 through reference to 35 IAC 212.461(c) or (d). Finally, the primary purpose of this plant is not to act as a grain elevator in the traditional sense that motivated the legislative intent of the statutory language. This is primarily an ethanol plant and not a stand-alone grain elevator.

The condition of the draft permit addressed by this comment properly reflect the provisions of the Environmental Protection Act (Act), which supersede the otherwise applicable state rules for grain elevators at 35 IAC 212.462. At the present time, the proposed plant would not be subject to any of NSPS for which federal regulations require a source to obtain a CAAPP Permit. (If federal regulations change in the future, a CAAPP permit could be required, which would also trigger applicability of 35 IAC 212.462 for the grain handling operations.) The various state rules cited in this comment do not act to trigger applicability of 35 IAC 212.462, given the overarching effect of the Act. Finally, the language of the Act is clear on its face and it is not necessary to speculate on legislative intent. If such speculation is desired, a better explanation of that intent is available than offered by this comment. The legislature acted because it found that the requirements of 35 IAC 212.462 were excessive if a grain operation was not causing air pollution, perhaps in part due to increased use of hopper trucks and improved dump pit designs, which have made the specific requirements of 35 IAC 212.462 outdated and unnecessary.

48. Even if the grain handling operations are exempt from 35 IAC 212.462, the requirements of these rules should be applied to assure compliance with applicable emission limits on the operations. Particularly for the fugitive emission limit from grain unloading, it is essential to ensure the design and operation of the dump pit to achieve the face velocity specified in 35 IAC 212.462(b).

The Illinois EPA agrees with the spirit of this comment but not its substance. To ensure effective control of fugitive PM emissions from grain handling operations, including the dump pit, the permit relies on the requirements of the federal NSPS for grain elevators, 40 CFR 60, Subpart DD. Even though the plant will not meet the applicability criteria of these rules, the relevant requirements of this NSPS are imposed on the proposed plant. This is because this NSPS sets restrictions on opacity and the presence of visible emissions from grain handling operations, so as to directly address the effectiveness with which fugitive PM emissions are controlled. Accordingly, the NSPS is a more appropriate means to address the adequacy of emission control measures than the equipment standards in 35 IAC 212.462, which many consider outdated given developments that have occurred in the grain handling industry.

49. Since compliance with the requirements of 35 IAC 212.462 is mandatory, the permit must include requirements for testing and operational monitoring to ensure compliance with those requirements. These would include measuring collection system flow rates at key locations based on testing of face velocities and establishment of set points for compliance evaluation based on flow rates, means to ensure that apportioned gas collection rates were being achieved, periodic opacity monitoring requirement to address the no visible emission requirement and other monitoring for each element of 35 IAC 212.462. In addition, ongoing operational monitoring and measures are needed to

ensuring compliance with the fugitive emission limits of Condition 2.3.6, for which compliance is dependent on effective capture of emissions.

As already explained, unless grain handling operations at the proposed plant cause air pollution, it is not expected that they will be subject to 35 IAC 212.462. However, the permit includes appropriate work practices and testing, instrumentation and recordkeeping requirements to verify that the measures to control PM emissions from the grain handling operations are properly implemented and to reasonably identify any lapses in such control measures.

50. The grain handling and milling baghouses must be subject to monitoring sufficient to assure compliance during the period between emission testing. Monitoring of pressure drop may be sufficient to ensure that gross baghouses failures are detected, but pressure drop is not a sufficiently sensitive technique to detect small leaks and other smaller filter failures that will interfere with compliance with the specified limit of 0.005 grains per standard cubic foot (gr/scf).

For baghouses used for grain handling and milling, as well as most other applications, the accepted practice for operational monitoring is measurement of pressure drop. The performance limit set for the baghouses at the proposed plant, 0.005 gr/scf, is not so different from the performance specification for most new baghouses in similar service, 0.01 gr/scf, to require additional operational monitoring. Monitoring of pressure drop will serve to both assure that the baghouse is being properly operated, without being subjected to high pressures that would threaten the integrity of the filter, and identify deterioration in the performance of a baghouse, which would be revealed by a low pressure drop.

51. Use of "manufacture recommendations" in the operational requirements and monitoring provisions for grain handling and milling operations at Conditions 2.3.5(c) and 2.3.5(d)(i) is indeterminate; such provisions cannot be enforced in practice. The permit should include specific enforceable requirements for emissions and parameter monitoring. For example, the baghouse pressure drop parameters and an envelope of variance from such parameters should be determined and fixed during emission testing. The permit should establish a procedure by which such limits on parameter set points and maintenances of minimum tolerances as an envelope of operation is established pursuant to testing and communications with Illinois EPA. The permit should also set minimum standards for accuracy and testing of pressure drop instrumentation.

For certain operational requirements and monitoring and instrumentation for operational parameters, a requirement that a source follow manufacturer's recommendations is enforceable. It is a simple matter to compare the actual practice or action to those that are recommended by the manufacturer. It is not necessary for the permit to establish specific protocols for measurement of parameters like pressure drop, temperature or liquid flow rate, for which operational measurements are routinely and reliably made by sources as part of their standard operating practices.

52. Continuous bag leak detection systems must be required on the grain handling and hammer mill baghouses to ensure compliance with the 0.005 gr/scf performance limit for

PM emissions. An annual baghouse inspection is not sufficiently frequent to provide assurance that compliance with applicable limits is being achieved.

Bag leak detection systems are used on large baghouses on units such as solid fuel fired boilers and steel furnaces. They are not necessary or appropriate for baghouses used on grain handling or milling operations.

53. Certain conditions in the draft permit that require emission testing, e.g., Condition 2.3.7 for grain handling, contain the words "as requested … as specified …," which suggests that emission testing is not mandatory. This wording should be changed to eliminate any suggestion that emission testing is only being requested, but is not required.

The conditions of the issued permit do not include the language from the draft permit addressed by this comment, which could easily have been misunderstood.

54. Condition 2.3.6(b)(i) should be more specific in referencing emission point descriptors and the stacks downstream from baghouses. The language used does not specifically identify the location of applicability for these emission limits. The fugitive emission points and process equipment for which Condition 2.3.6(b)(ii) is applicable should also be specifically named to reduce the potential for unclear interpretation of the applicability of requirements.

The permit adequately and appropriately specifies applicability of emissions limits to particular emission units. Limits apply to the units that generate emissions, or when such emissions are controlled, the emissions of the units considering the effect of the associated control device. As separate limits are established for "controlled" and "fugitive" emissions from a unit or units, the limit for controlled emissions applies to the exhaust from the control device and the limit for fugitive emissions applies to emissions that are not captured. In this regard, Condition 2.3.6(b)(ii) addresses all PM emissions from the grain handling and milling operations that are not captures. It is not necessary for the permit to identify the specific stacks to which limits apply, particularly as doing could lead to future controversy if the permit inadvertently failed to identify all relevant stacks.

The permit also appropriately addresses emissions from the proposed plant as a whole. In addition to limiting the emissions of individual units or groups of units, the permit also sets overarching limits on the total emissions of the plant. This provides certainty as to the overall emissions of different pollutants for which the proposed plant is being permitted.

55. Conditions 2.3.6(a)(ii) and (iii), which address grain handling operations, should either state that these opacity limits apply on an instantaneous basis or on a 6-minute average.

The issued permit provides that the opacity limit applies on a 6-minute average, consistent with the applicable USEPA test method, Method 9. The prohibition against visible emissions is an "instantaneous" requirement, as implicit in the language and the associated USEPA test method, Method 22.

56. The permit should prohibit the plant from receiving grain from straight trucks (dump trucks). The PM emission calculations for the plant assumed that all deliveries would be made by rail cars and trucks with hopper bottom unloading capability. The PM emission factors for grain unloading from straight trucks are considerably higher and were not used in the emissions calculations. Any receiving of grain from straight trucks would push the plant over the 100 ton/year major source threshold for PM, so it is necessary to ensure that such grain deliveries do not take place, with a prohibition in the permit.

The issued permit includes a requirement that the grain receiving area be equipped with quick closing doors and an aspirated dump pit if grain is received from straight trucks. This appropriately addresses the additional PM emissions that might accompany receiving of grain from straight trucks.

57. If the plant intends to receive grain by straight truck (e.g., grain directly from area farmers), then the emission calculations must be redone and a limit placed on the number of such trucks per year that may unload grain at the plant. At the very least, Marquis must disclose the expected split between deliveries between straight and hopper bottom trucks. Finally, if the plant ever intends to receive untried grain directly from area farmers, the emissions estimation method used for grain receiving significantly underestimated actual emissions.

As explained above, the issued permit requires that the grain receiving area include certain control measures, i.e., an aspirated dump-pit and quick closing doors, if grain is received from straight trucks. This addresses the additional PM emissions that would otherwise potential be present if grain is received from straight trucks. The plant is not being developed with the capacity to mill wet grain, so the permit does not need to include provisions to address handling of wet grain.

58. The permit should prohibit all outdoor storage of grain for any reason, such as storage of off-specification grain, or outside storage of milled grain from upsets of the mash preparation process.

It is not appropriate for permit to address the outside storage of grain because the plant is not being developed with facilities to store grain outside or to subsequently handle grain that has been stored outside. It is also not appropriate for the permit to speculate on upsets that might occur at the plant and the actions that might be needed to address them.

Mash Preparation and Fermentation Area (Condition 2.4)

59. The application does not indicate whether the emission factor used to calculate VOM emissions from fermentation scrubber is based simply on USEPA Method 25/25A measurements or on scaled determinations for total VOM compounds considering the mass contribution of oxygenates as required by USEPA policy. Until such information is provided, the application should be considered incomplete.

These emission calculations are based on the actual mass of VOM emissions, not measurements of VOM expressed as carbon, methane or other gas standard.

60. The VOM emission factor used in the application for the proposed plant is 698 lb/million gallons of ethanol, yielding annual VOM emissions of 38.39 tons/yr. In the application for the proposed Patriot Renewable Fuels plant in Anna wan (Patriot), which is also presently before the Illinois EPA, the VOM factor is 910 lb/million gallons, yielding 50.0 tons/yr. In both these, documentation for the VOM emission factor for the fermentation scrubbers is poor.

The differences in the VOM emission factors for the fermentation scrubbers at these proposed plants result from differences in the overall design of the respective plants and the specific design and specifications for the respective scrubbers. The Patriot plant uses direct fired feed dryers. These dryers are projected to have lower VOM emissions than the steam heated dryers at the proposed plant. The lower VOM emissions from drying accommodate higher VOM emissions from the fermentation area, while still maintaining status as a minor source. With the steam tube dryers at the proposed plant, lower emissions are required at the fermentation scrubber to maintain status as a minor source.

61. For the fermentation scrubber, Condition 2.4.6(a) provides that the VOM emissions from the fermentation tanks and beer well, which will be controlled by the scrubber, shall not exceed 698 lb/million gallons ethanol or be controlled by at least 98 percent by weight. This condition does not provide effective physical limits on production or process rate and therefore does not limit potential emissions. First, the provision allows the alternative of either a pound per ethanol final product limit or 98% control. The latter is not a physical limit on the production or process rate and does not constitute a physical limit on the potential to emit. Second, there is no short term production or process rate commensurate with the hourly VOM emission rate, 9.06 lb/hr. The maximum rate of grain input to the plant must be limited on an hourly basis in order to limit potential to emit on a short term basis. The emissions of the fermentation process should be limited through limits on the actual rolling average annual and daily feed rate of mash input (preferred) or the amount of milled corn introduced into the process.

Condition 2.4.6(a) sets operating limits that function with other limits and requirements in the permit to restrict the potential emissions of the fermentation units. As observed by this comment, this condition does not set a production limit. The limit on production of the plant, expressed in terms of ethanol production, is found elsewhere in the permit.

While USEPA guidance provides that operational limits and emission limits should be set on as short a time period as possible, so as to maximize practical enforceability, USEPA guidance does not require that production or operating limits be established that apply on an hourly basis. Certainly, USEPA guidance does not envision limiting a source or unit's "potential to emit on a short term basis" as suggested by this comment.

62. Limiting the VOM emissions of the fermentation scrubber on the basis of the final ethanol production rate, which occurs far downstream in the overall plant, is not appropriate and does not efficiently limit the emissions of the scrubber. This is because of the variabilities of the processes downstream from the fermentation area, such as the efficiency of the distillation process.

The relevant provision in the issued permit clarifies that the production based VOM limit for the fermentation scrubber is to be based on the amount of ethanol being produced by the fermentation process itself, expressed in terms of equivalent plant production.

63. Condition 2.4.5(a)(i) in the draft permit provides that the key operating parameters of the fermentation scrubber shall be maintained at levels consistent with levels at which emission testing demonstrated compliance with applicable requirements. The language is not sufficiently explicit to make enforceable a process whereby emissions testing is performed under different process operating variables and an envelope of acceptable operating parameters for the scrubber is determined and then made enforceable. Based on parameter monitoring, there must ultimately be a clear method that provides enforceable criteria as to when a unit must be considered out of compliance.

The language of Condition 2.4.5(a)(i) is clear. After emissions testing of the fermentation scrubber is performed, the plant must continue to operate the scrubber with a minimum water flow rate, maximum water temperature and maximum exhaust gas temperature that are consistent with the values of these operating parameters during emissions testing. Deviations from these operating requirements would be a violation of this condition. This has obvious consequences for the operating conditions under which the plant elects to conduct emission testing of the scrubber, i.e., testing must be conducted with values of these operating parameters that can be consistently and reliably maintained. While testing of the scrubber with more water or colder water would show lower VOM emissions, it would also create a future obligation to always operate with "more water" or "colder water." Of course, emissions testing must also be conducted when the scrubber is operating with enough water or water that is cool enough so that the scrubber meets applicable limits.

Given the straightforward nature of the fermentation process, the Illinois EPA expects that there will be only a single normal operating mode for the scrubber. Accordingly a series of tests of the scrubber under different operating modes will not be performed. If the plant does elect to conduct several tests to address different operating modes or to establish a more complex relationship between the specified parameters, this would initially be addressed by the Illinois EPA as part of the review of the plan for testing. It would be further addressed as part of the processing of the operating permit application for the plant. For example, the different operating modes of the fermentation process would be defined, for which each set of operating parameter values would apply.

64. The conditions of the permit that set required values of operating parameters for the fermentation scrubber, as well as for other control devices, must be written to ensure that the plant may not "cherry pick" operating parameters to comply with only a single emission limit at a time. The process of establishing an operating condition envelope for compliant operation must reflect simultaneous compliance with all limits demonstrated with simultaneous and corresponding ranges of operating conditions during the test.

The draft permit does not allow "cherry picking" of operating requirements, as this comment cautions against. Where the permit contains multiple operating requirements for a control device, all requirements are to be met. Expressed in other words, a deviation from

a single requirement for a control device is a deviation from proper operation of the device, even if the device is "overcomplying" with other requirements.

65. It is unclear whether "differential pressure across the scrubber" is considered a "key operating parameter" for the fermentation scrubber. The flow rate and temperature of the liquid scrubbant in the scrubber, which is a packed tower scrubber rather than a high energy scrubber, are much more important to the proper operation of the scrubber than differential pressure.

Differential pressure is not treated as a "key" operating parameter of the fermentation scrubber This is why the permit has separate provisions for proper operation of the scrubber relative to key operating parameters, i.e., scrubbant flow rate and temperatures, and proper operation relative to pressure drop. If the pressure drop of the scrubber goes outside the normal range, it is not a deviation from operating requirements for the scrubber. However, it does trigger a requirement to initiate appropriate corrective action to restore the differential pressure to the normal range.

66. The language at Condition 2.4.5(a)(ii), which relates to an operating range of the differential pressure as "defined by the Permittee" to required actions by the plant, is particularly offensive. This is because it imparts to the plant the sole discretion to determine the final form of an applicable requirement without reference to the determination through a compliance test or other agreed upon procedure. Such provisions are not practically enforceable.

This condition is appropriate and is not unenforceable. As a general matter, there is nothing improper about requiring a source to initiate corrective action when a unit is operating abnormally, particularly if the initial burden for defining normal and abnormal operation is placed on the source. While it may be distasteful to allow a plant to define abnormal operation for a particular operating parameter, this is direct consequence of the secondary role of differential pressure in the performance of the fermentation scrubber. This prevents the pressure differential during emission testing from being used as an appropriate basis to distinguish between normal and abnormal operation.

While it may seem that the plant is being given complete discretion to define abnormal operation of the scrubber, the plant is subject to continuing supervision by the Illinois EPA. If the plant fails to take timely corrective action in response to changes in the differential pressure of the scrubber and the performance of the scrubber and compliance are eventually affected, the Illinois EPA can cite the plant for violation irrespective of any definition of abnormal operation selected by the plant. The plant is best served by developing a sound and reasonable definition of abnormal operation that allows timely corrective action to be initiated well before compliance is threatened.

67. Condition 2.4.5(b)(iii)(C), which address the Control Improvement Program for the fermentation scrubber, does not contain a deadline for retesting of VOM emissions.

The issued permit requires retesting of VOM emissions to take place within 60 days of completion of a Control Improvement Program.

68. The draft permit should require that emission testing for the fermentation scrubber be conducted when process units are operating at least at 95% of their maximum rate.

The permit generally requires that emission testing be conducted during operating conditions that are representative of maximum emissions. (See Condition 3.1-1(a).) An obvious element of the operating conditions that produce maximum emissions from emissions units controlled by a scrubber is operation in the maximum operating range of those units, so to present the scrubber with a high pollutant loading and high flow rate.

69. For the fermentation scrubber, Condition 2.4.8(a) indicates the monitoring equipment "....shall be installed, operated, maintained and calibrated according to the supplier's specifications...." Such language is vague and unenforceable and should be replaced with specific requirements and standards for accuracy of monitoring devices, testing and calibration requirements and requirements for at least 95% valid data recovery from such process and scrubber monitoring devices.

This requirement of the permit is enforceable. As already explained, requirements for monitoring flow rates and temperatures do not need to be accompanied by detailed protocols for how such monitoring shall be conducted.

70. The "uncontrolled" VOM generated by the fermentation process depends on the fermentation cycle in each tank, breathing losses, displacement losses upon filling and other factors. Actual VOM emissions depend on surrogate parameters of both the process generation of VOM and the parameters of scrubber operation. As a result, the recordkeeping operations required under Condition 2.4.9(a) are insufficient to reflect process and scrubber control parameters from which emissions can be determined and compliance with emission limits assured.

The records required by Condition 2.4.9(a) are not intended to be used to directly determine VOM emissions from the fermentation area or compliance with VOM limits. Rather they are intended to provide basic information about the operation of the fermentation tanks so that the Illinois EPA can readily identify any significant changes in the fermentation process. If such changes did occur, the Illinois EPA would then be able to assess whether the changes would significantly affect the VOM emissions generated from fermentation, so that retesting of the fermentation scrubber should be required

71. The recordkeeping requirements of Condition 2.4.9 do not reflect the extensive parameter monitoring requirements of Condition 2.4.8. At a minimum, all parameter monitoring of Condition 2.4.8 must be incorporated into required recordkeeping provisions.

Whenever monitoring and instrumentation are required by the permit, recordkeeping for measured data is also required. This principle has been explicitly stated in Condition 1.5 of the issued permit. Accordingly, the permit does not have to separately address recordkeeping for the data collected or measured by each required monitor or instrument.

72. The draft permit does not indicate exactly how fermentation emissions would be calculated from monitored data and required records. Since the fermentation tanks operate as batch processes, rather than merely addressing tank liquid levels, recordkeeping must address aspects of the fermentation cycle on each tank, such as the time of filling, tank temperatures, hourly average fermentation rate, hourly average transfer rate to the beer well and likely other factors. The rate of emissions would be functions of both these factors and the control device operating parameters. Until there is a firm method for making ordinary emission determinations from this unit from process and control device parameters listed in the permit, a permit should not be issued. If emissions will instead be related solely to a function of operating parameters for the scrubber and process throughput in the fermentation area, then this decision should be documented and sufficient monitoring and recordkeeping should be imposed to both support emission determinations and assure compliance with applicable limits.

As explained above, the permit does not intend that emissions generated by the fermentation area would be calculated from detailed operating data for the fermentation area. Rather, emissions from the fermentation area would be calculated from general emission factors for the area, which would be based on the results of emissions testing. Compliance would be determined by proper operation of the fermentation scrubber, in a manner that is consistent with the operation of the scrubber during the most recent emissions testing that demonstrated compliance with applicable limits and requirements.

73. Because of process and control device variability and because of the small margin from the major source threshold for VOM, the permit should require a continuous VOM emissions monitor on the fermentation scrubber. VOM monitoring is clearly an available and appropriate technology for this control device.

The circumstances of the fermentation process do not justify continuous emissions monitoring for VOM. First, the process is not believed to be as variable or complex as the comment implies. Second, the permit requires that the fermentation process and associated scrubber be developed and operated so as to ideally operate at no more than 80 percent of the applicable limits for VOM emissions. Third, operational monitoring is adequate to both verify proper operation of the scrubber and identify improper operation of the scrubber. Finally, monitoring for VOM emissions is not readily implemented, as monitoring for VOM poses the same issues for accurate quantification of VOM emissions that are posed by emissions testing, which USEPA has addressed in its industry specific guidance for VOM emissions testing at ethanol plants.

74. Condition 2.4.10(a)(i) of the draft permit, which addresses immediate reporting by the plant for certain deviations from operating requirement for the fermentation scrubber, is not specific enough for proper enforcement. This is because it is not clear what a 2.0% exceedance would be. A 2% temperature exceedance in ºF would be different than a 2% exceedance in ºC. Does a 2% exceedance mean 2% above the floor or a maximum value of an operating parameter? The permit should address parameter envelopes of expected operations proposed for establishment on process and control device parameters during emissions testing, with subsequent approval by Illinois EPA.

The issued permit expresses temperature values in °F to provide clarity on how a 2% exceedance of an operating parameter value for temperature is to be determined. For parameters for which minimum values are set, immediate reporting would be required if the actual value of a parameter were 2% less than the set value; for maximum values, immediate reporting would be required if the actual values were 2% higher than the set value. In addition, the plant would have to report all exceedances in its quarterly reports.

The permit clearly defines the general mechanism by which the required or set values for operating parameters would be set, i.e., the value of the specified operating parameters during testing. Any further action or "interpretation" that becomes necessary with respect to the set values of operating parameters for the fermentation scrubber can occur in the processing of the operating permit for the plant by the Illinois EPA.

75. Condition 2.4.6(b)(ii) limits PM emissions from the fermentation scrubber to more than 0.13 lb/hr and 0.58 tons/yr. However, the permit does not include monitoring or testing requirements to verify compliance with these limits. The application does not include details on physical control measures to limit PM emissions from this unit, such as limits on the dissolved solids concentration of the scrubbant water, the average aerodynamic aerosol diameter of the spray nozzles in the scrubber, or the type of demisting technology that will be used, if any. In the absence of such information there is no basis to make the determination that PM emissions will meet the specified limits.

The issued permit requires testing of PM emissions from the fermentation scrubber. This testing will provide the necessary basis to determine whether specific compliance procedures are needed to address PM emissions from the scrubber, which the application describes as having minimal PM emissions. If compliance procedures, i.e., work practices, sampling, instrumentation, or recordkeeping, are needed to address PM emissions, they can be established in the operating permit for the plant.

Miscellaneous VOM Emission Units (Condition 2.4)

76. For VOM emission units, there are inconsistencies in the description of units between the application and the draft permit and internal inconsistencies in the draft permit itself. For example, the "General Plant Process Flow Diagram Plant Emissions (Preliminary)" in the application indicates the cook water tank would be controlled. (This diagram does not even show the Centrate tank.) However Conditions 2.4.1 and 2.6.1 of the draft permit indicate that the cook water tank and the flash tank "would be controlled" by the thermal oxidizers. Condition 2.4.2 indicates that the flash tank and cook water tank will not be controlled. Condition 2.4.6 also indicates that the cook water tank will not be controlled. The process flow diagram shows the flash tank being controlled, as it vents to the side stripper column in the distillation area, but the draft permit does not show this. Clarity and consistency are required for whether and how the units at the proposed plant will be controlled because of the small margin from the major source threshold of 100 tons/year.

The issued permit corrects these errors in the draft permit. The issued permit is based on the cook water tank <u>not being controlled</u>, consistent with further information supplied by

Marquis. The permit is based on flash tank being indirectly controlled, as it vents to a process unit in the distillation area, which eventually is vented to the thermal oxidizers.

77. The cook water tank receives once through flow from the fermentation scrubber and should contain significant amounts of ethanol. All of the VOM emissions potential of the mixer, a controlled unit following the cook water tank, comes from the ethanol laden cook water. The emission calculations in the application for the cook water tank also suffers from being derived from an existing 40 million gallon/year plant rather than being developed for the considerably larger proposed plant. The cook water tank should be required to be controlled by the oxidizers.

The information in the application for the cook water tank shows that this water holding tank would not be a significant source of VOM emissions, with both a low exhaust flow rate (less than 50 scfm) and low VOM concentration (less than 50 ppm). While the water held in the cook water tank may contain ethanol, the information in the application indicates that this ethanol is retained until the water is transferred to the mixer, which is controlled.

78. The application discounts the need for controlling VOM emissions from several process tanks on the basis of brief Organic Vapor Analyzer measurements on a much smaller plant. Nothing in the application indicates that the tank process variables and design of the planned plant are the same as the plant for which measurements were made. For example, it is impossible to know from the application whether the tanks envisioned for the proposed plant and the tanks whose emissions were measured on the smaller plant both had submerged fill, a detail that could be relevant for whether the emissions are comparable.

The permit application adequately addresses these "miscellaneous emission units." As confirmed by Marquis, the emissions from these tanks were properly calculated to account for differences in the size of the existing plants at which measurements were made and the size of the proposed plant, size and to account for other relevant factors in calculating VOM emissions. The issued permit also appropriately addresses these units as it requires that the plant keep records for the emissions of these units. The permit also includes provision for the plant to have VOM emissions testing conducted for these units if ever requested by the Illinois EPA.

79. The projected VOM emissions for the stillage tanks, the syrup tank, the cook water tank, and the liquifaction tank were all calculated on the basis of the exhaust rates of tanks at a smaller plant with only 41% of the capacity of the proposed plant. There is no reason to believe the exhaust rates of these tanks will be the same at the proposed plant, with its larger tanks and higher throughputs. The emissions of these miscellaneous tanks could push the plant over the 100 ton/year major source threshold. Failure to properly consider the potential emissions of these tanks would constitute improper permitting the proposed plant. At the very least, the permit should require periodic testing of these tanks and mandate that a tank be controlled if found to have VOM emissions that would push the plant over the major source threshold.

It is not appropriate for the permit to specify particular consequences if the plant's emissions were to exceed the major source threshold. If this were to occur, it would be a violation and the specific consequences for violations are determined on a case-by-case basis in the context of a potential or actual enforcement action.

80. The Fugitive VOM Survey" in the application indicates that the mash screen, where residual material removed from the fermentation tanks during each cleaning cycle is screened, is a unit that should be controlled. But the downstream fugitive process VOM emissions potential for the wet solids flow is not completely characterized. The emission calculations in the application for the mash screen indicate that it will be controlled by the oxidizers, but this is not reflected in the draft permit. However, in the draft permit, the Mash Screen is shown without control, so the draft permit allows uncontrolled emissions from these units. The is not included with the miscellaneous units, whose VOM emissions are limited to 0.65 ton/year.

While certain information in the application suggested that the mash screen at the proposed plant would be controlled, this is not the case. Marquis has confirmed that the mash screen would not be a significant source of VOM emissions The permit for the proposed plant is based on the mash screen not being controlled, with its emissions addressed with other small, uncontrolled "miscellaneous units." With the explicit inclusion of the mash screen with the miscellaneous emission units, the issued permit now limits the VOM emissions from these miscellaneous units to no more than 0.70 tons/year, in total.

81. The emission calculations in "Fugitive VOM Survey" in the application, indicate that the Centrate Tank would be controlled by the oxidizers. However, the draft permit does not list the Centrate Tank, so the draft permit allows uncontrolled emissions from this unit. However, the Centrate Tank is not identified as one of the miscellaneous unit, whose VOM emissions in total are limited to 0.65 ton/year.

The Centrate Tank is to be controlled by the thermal oxidizers, as indicated in Condition 2.6.2 of the draft permit. In the issued permit, the Centrate Tank is also identified in Attachment A of permit as being controlled

82. Condition 2.4.6(c) in the draft permit, which addresses emissions of "miscellaneous units," is not practically enforceable because the permit does not include testing and monitoring conditions that would provide for compliance determination or a short term emission limit that would make practical enforcement possible.

The issued permit includes recordkeeping and emissions testing requirements to make the limit for miscellaneous units enforceable as a practical matter. It is not necessary or appropriate to set hourly emission limits for these units given their nature.

83. Although the application indicates that the syrup stream from the evaporators is mixed with wet cake from the centrifuge before drying and that the evaporated water is sent to the biomethanator, this is not sufficient to ensure that VOM emissions do not occur as overhead vapor flow from a condensation operation to which evaporator vapors are directed. There is no information on whether eductors are used as a motive force for

condenser flow and whether there are any emissions associated with the evaporation process for thin stillage.

In supplemental information, Marquis has confirmed that the evaporators will not generate emissions. The evaporation process makes syrup, which is mixed with stillage that is dried, and condensate water, which is ultimately returned to the mash preparation area, after processing in the biomethanator.

84. The application does include specific details on how wet cake and modified wet cake will be managed. (Wet cake is feed material that is sold without being dried. Modified wet cake is dried to about 50 percent moisture to extend its shelf life, which even then is measured in days.) Without information on wet cake process management, e.g., the temperature of the material as it is handled and the extent of indoor vs. outdoor management, the application is not complete and fails to adequately calculate the potential emissions of the proposed plant.

The emissions calculations in the application conservatively assume that all stillage would be processed into dried feed. This is conservative because processing of stillage and syrup into dry feed in the feed dryers generates more VOM emissions that handling the stillage wet, for sale as wet cake.

85. The application does not "ramp up" expected VOM emissions from some of the example smaller ethanol plant information cited for wet cake related emissions at points other than loadout. The application does not include adequate drawings to show whether ventilation flow through the centrifuges is routed to the dryers. However, if the dryers are control units for centrifuge exhaust during drying operations, then when wet cake is being produced, there may be an effect on the centrifuges as a VOM unit.

The emissions from production of wet cake were addressed on a per-ton-basis, so scaling of emission data was not required. Production of wet cake would not alter the emissions control requirements that apply for the dryers or associated oxidizers, which also must be operated to control various units in the mash preparation area and the distillation area.

86. Unlike the application submitted for the proposed Patriot plant, the application for the proposed plant does not provide emission calculations for VOM emissions from storage of wet cake. Annual VOM emissions from wet cake are shown as 4.0 tons, with no basis provided. The VOM emissions from wet cake storage must be considered. The Patriot application contained the results of one test of such emissions but there was no effort to scale emissions to a 110 million gallon/year plant. In the information cited, half of the wet cake was four days old, but emissions of the most VOM can be expected to flash off very soon after the wet cake leaves the screening location at elevated temperatures. Because of this, the cited case for pad storage of wet cake cannot be considered as reflecting the potential emissions for the unit. If outdoor pad storage of wet cake is used, then emissions calculations must consider the maximum ambient temperature together with maximum wet cake temperature when loaded onto the storage pad. In this regard, the Natural Resource Group work submitted by Patriot (not Marquis) appeared to have

been performed for unheated indoor storage area in Minnesota in November and would not reflect the potential emissions at higher temperatures.

Finally, without restrictions on the maximum storage time, the potential for VOM emissions from biological degradation of wet cake during storage must be considered. Otherwise, the permit must require "first in, first out" methods of dispatch for wet cake and other controls on the length of time for storage in order to properly limit emissions from storage.

Marquis has submitted additional information for the referenced emission testing for storage of wet cake. This information confirms that this emissions testing was conservatively conducted with additional "handling" of the warm wet cake entering the storage area, to increase exposure to the air and maximize VOM emissions from the wet cake. These actions would act to compensate for any effect from the actual air temperature of the storage building or variations in the duration of storage.

It is not necessary for the permit to specify "first in, first out" handling of wet cake. This is an obvious practice for handling of wet cake (as well as many other commodities), as is minimizing the length of time that wet cake is stored at the plant.

87. If uncovered wet cake is stored outdoors, this practice would pose a risk for water pollution due to stormwater runoff from the pile. If such stormwater were then controlled in a retention pond, the potential emissions of the pond must also be considered, in addition to the emission from the outdoor storage pad itself.

Any outdoor storage or handling of wet cake at the plant must be conducted in a manner to control any stormwater runoff, which is subject regulations that govern wastewater discharges from manufacturing plants. A common approach to stormwater management is collection of potentially contaminated storm runoff in a retention pond, to allow treatment if needed. Retention ponds at ethanol plants have not been identified as a source of concern for emissions.

Distillation Area (Condition 2.5)

88. The application is incomplete because it does not showing the disposition of process off-gases from the molecular sieve regeneration cycle. Molecular sieves traditionally features two parallel process trains, with one in use for ethanol dehydration while the other is in a regeneration cycle. The regeneration cycle regenerates the molecular sieve matrix by removing water/weak ethanol solution using a vacuum. The vacuum apparatus and any condenser or steam eductor are likely to have some type of venting. Note that the condenser associated with molecular sieve regeneration will be different from the 200 proof condenser, which is used to process the ethanol vapor output of the molecular sieves during actual operation.

Marquis has submitted information confirming that the regeneration of the molecular sieves would not generate VOM emissions that have not been otherwise accounted for. This is because the liquid stream from regeneration is recovered for its ethanol content.

Any vapors from regeneration are vented to the centrate tank, which is controlled by the thermal oxidizers.

89. For fermentation units, which are controlled by the oxidizer, Condition 2.5.5 should clarify that during the shutdown of units, the heat input level of an oxidizer shall be maintained above the specific level that has been previously demonstrated in emissions testing to show compliance with applicable limits.

The issued permit clarifies operating requirements for the oxidizer during shutdown of emission units. (See Condition 2.6.5-1(c).) However, it is not appropriate to require that a specific firing rate be maintained during such periods. The permit instead restates the general obligation that equipment be operated in accordance with good air pollution control practice. This requires that the temperature in the combustion chamber of the oxidizer be maintained at the "compliant" level for as long as it is feasible to do so, ideally until after process units are shutdown. If operation of process units lags behind the oxidizer, they must be expeditiously shutdown once the temperature in the oxidizer drops below the compliant level.

90. Condition 2.5.9(b) belongs in Condition 2.6, where all of the requirements relating to oxidizer operation should be consolidated.

The issued permit includes all operating requirements for the thermal oxidizers in Condition 2.6, consistent with the recommendation made in this comment.

91. The operating parameters of the distillation area identified in Condition 2.5.9(a)(iii) and (iv) are not realistic indicators for operation of the distillation area nor is the language clear. Does the "feed rate" refer to the condensers and thus the "feed" that is measured is ethanol vapor? Or is the feed rate the liquid output rate of the condensers? It is also not clear that monitoring of the specified parameters can be used to predict emissions from the oxidizers. If the objective of process-related monitoring is to determine emissions, then the gas flow from the two distillation condensers will be among the appropriate parameters of interest. If the calculation of emissions at the oxidizer associated with distillation VOM destruction is the objective, then it would also be necessary to determine the mass rate of VOM in such flows during emissions test, along with continuous volumetric monitoring. If the objective of the conditions is to relate VOM emissions from the oxidizer to the distillation process rate, it is not clear the four independent process variables addressed in Condition 2.5.9(a) will achieve this a purpose.

The purpose of the records required by Condition 2.5.9(a) is to assure that the normal operating parameters of the fermentation operation are documented so that short-term or long-term changes in operation can be identified. These records are not intended to be used on a routine basis to calculate the contribution of the distillation area to VOM emissions as occur through the thermal oxidizers. The operating parameters for which the issued permit requires the normal values of operating parameters to be kept are: 1) ethanol content of beer in the beer well; 2) feed rate to the beer column; 3) feed rate to the molecular sieve; and 4) condenser cooling water temperature.

92. If recordkeeping is required for distillation process parameters, the presence of monitoring devices to gain such information is implied. However, the draft permit does not contain conditions that require such monitoring devices to be calibrated or maintained or to conform to accurate measurement standards.

The issued permit specifies that the plant must operate all required monitoring devices and instrumentation in accordance with good monitoring practices. This requires that required monitoring devices and instrumentation be appropriately calibrated and maintained to provide accurate measurements.

93. The application does not include information on the potential for VOM emissions through pressure relief valves and rupture disks in the distillation area. If the distillation area will have pressure relief valves, rupture disks, flow diversion valves or other kinds of bypass release devices, these devices should be listed and their emissions should be subject to recordkeeping requirements. If such are part of the design, reference to any such emissions should be included in the provisions of Condition 2.5.9(d). In addition, these devices should be subject to the requirements of a Leak Detection and Repair Program.

Marquis has indicated that the distillation area would not include pressure relief devices that would vent to the atmosphere. However, if such devices must ultimately be included in the design of the distillation area, with discharge to the atmosphere rather than to a control device, they would be addressed by Condition 2.9 of the issued permit. This condition addresses components of the piping system and access hatches in process vessels at the plant that are in VOM service but are normally closed to the atmosphere. As such, it is also the appropriate condition to address pressure relief devices. Condition 2.9 does require that the plant implement a Leak Detection and Repair Program, which program would have to extend to any pressure relief devices in VOM service in the distillation area.

94. For the feed dryers, the PM emission calculations in the application are based on a factor of 0.033 lbs per ton of dry feed, with drying of all feed from the plant (356,880 tons of dry feed per year). The application also cites an uncontrolled PM factor, 2.0 lb/ton feed. The application indicates that both these factor address condensible PM. However, review of the emission test results from Glacial Lakes Energy, Watertown, South Dakota (Glacial Lakes), (which were included in the application as support for the PM emissions factors) shows that the Glacial Lakes testing does not support the factor used to calculate PM emissions from the proposed dryers. The test results submitted for Glacial Lakes do not contain data for condensible PM emissions. The test results only provide data for "dry catch only," i.e., data for only filterable PM. (In this regard, PM measurements may or may not include the "wet catch," which is the condensible PM, based on the applicable state rules and permit.) Thus, the application's claim that the PM factors for the proposed dryers reflect condensible PM is false. Further, the calculations showing that total PM emissions from the dryers will be no more 5.89 tons/yr must be rejected since those calculations were made without accounting for condensible PM.

In addition, with a production rate of 15.0 tons/hr at Glacial Lakes (based on handwritten annotations on the material submitted in the application), the uncontrolled PM factor at

Glacial Lakes was 0.57 lbs/ton feed. The application indicates 90% control efficiency, which would yield a controlled PM factor of 0.057 lb PM/ton feed, which is about twice the controlled factor used in the application, 0.033 lb PM/ton feed. The application cannot claim that 90% PM control and the Glacial Lakes uncontrolled PM factor yields 0.033 lbs/ton of feed, the PM factor used in the application,. In addition, the Glacial Lakes test showed only 87.5% PM control. Based on this analysis, the PM emission calculations in the application must be considered in error. The underestimation of emissions would be about 4.28 tons/yr, putting the plant over the major source threshold for PM. Moreover, the Glacial Lakes' measured factor for controlled, filterable PM is 0.071 lbs/ton feed. This is over twice the claimed 0.033 lbs PM/ton factor for both filterable and condensible PM combined.

The application is defective because of the erroneous PM emission calculations for the oxidizers, which are not supported by the Glacial Lakes test results. A permit should not be issued because use of a proper PM emission factor would increase expected total PM emissions so that the proposed plant would be a major source.

Marquis has confirmed that the controlled emission factors for the feed dryers and other units controlled by the thermal oxidizers are not based simply on the testing at Glacial Lakes. The factors are engineering values based on the specific design for the proposed plant, as guided by actual experience at Glacial Lakes, as well as experience at other ethanol plants. In particular, the testing at Glacial Lakes cannot be directly transferred to the proposed feed dryers because Glacial Lakes performs direct-fired drying, while the proposed plant would use multi-stage steam heated dryers. Steam heated dryers generally have lower uncontrolled emission rates that direct-fired dryers. This effect is most significant for pollutants for which dryer temperature is a key factor in the generation of emissions, e.g., condensible PM.

Incidentally, while not explicitly stated, the Glacial Lakes test report does provide data confirming that the production rate of the feed dryer was approximately 15 tons/hr. This is because the report provides data for emissions in both lbs/hour and lbs/ton. The operating rate during testing, 15 tons/hr, can be calculated by dividing one value by the other.

95. In the VOM emission calculations for the feed dryers, the application uses a factor of 97% efficiency for the thermal oxidizers, which is less than the 98% control required by the draft permit. The application also cites the uncontrolled emission rate measured at Glacial Lakes, 40.13 lbs VOM/hour, as carbon, measured by USEPA Method 25A. Using USEPA's current scalar for ethanol plants, 2.2, to convert from a carbon basis to VOM basis, the uncontrolled dryer emissions were 88.29 lbs VOM/hr, or 5.89 lbs VOM/ton of dry feed, based on 15 tons of dry feed/hour. At 97% control, this would convert to a controlled VOM factor of 0.177 lbs VOM/ton of dry feed. At the 98% control factor required in the draft permit, this would convert to 0.118 lbs VOM/ton of dry feed. On the basis of these emission factors, the potential VOM emissions of the feed dryers at the proposed plant would exceed 17.84 tons/year, with emission of 31.6 tons/year at 97% control and 21.1 tons/year at 98% control. When added to the VOM emissions of other units at the plant, this would cause the plant to be a major source.

The application also indicates an uncontrolled VOM emission factor for the feed dryers of 10 lbs/ton of feed. At the 98% control required by the permit, the controlled VOM emission factor would be 0.2 lb/ton, yielding even higher annual VOM emission from the feed dryers. On the basis of either the uncontrolled VOM emission factor of 10 lb/ton of feed or the Glacial Lakes VOM emission factor of 5.89 lbs/ton of feed, the permit provision of 98% control would not assure compliance with the specified hourly and annual VOM emission limits for the oxidizers.

Finally, the application fails to include any information about the uncontrolled VOM inlet rate from the non-dryer process units that are also controlled by the oxidizer. Calculations based only on the dryer VOM emissions do not fully address the emissions from the oxidizer.

As explained above, the controlled VOM emission factor for the feed dryers and other units controlled by the thermal oxidizers is an engineering value based on the specific design for the proposed plant, as guided by actual experience at several plants. In addition, as noted in these comments, the permit requires that the oxidizer achieve a minimum VOM control efficiency of 98%, which is greater than the 97% proposed in the application. If the total uncontrolled VOM emissions from the various units at the proposed plant controlled by the oxidizers are 10 lbs/ton of feed, as conservatively assumed in the application, the oxidizers at the proposed plant could have to operate with a VOM control efficiency of 99%. This is not beyond the capability of the oxidizers, since oxidizers can operate across a wide range of temperatures and the natural gas fired burners have reserve capacity. Indeed, the Glacial Lakes testing showed the oxidizer had a VOM control efficiency of about 98.5%, with a controlled VOM emission factor of 0.08 lbs/ton of dry feed.

In addition, it is apparent the application has accounted for additional VOM from the "other units." The application conservatively assumed uncontrolled VOM emissions of 10 lb/ton feed, while the Glacial Lakes testing showed only about 6 lbs VOM/ton feed. In fact, given the low volume and relatively high VOM concentration in the combined gas stream from the units other than the dryers that are controlled by the oxidizers, the VOM contribution from these other units is a minor element in the evaluation of VOM emissions from the overall dryer/oxidizer systems. A second controlled VOM emission factor need not be explicitly included in the emission calculations for the oxidizers to separately account for the contribution of these other units to emissions.

96. The application does not explain the basis for the factor used to calculate CO emissions from the feed dryers, 0.260 lbs CO/ton of dry feed. The application also provides an uncontrolled CO emission factor of 10 lb/ton of dry feed. Based on 90% control by the thermal oxidizers, this would yield a controlled factor of 1.0 lb CO/ton of dry feed, which is about four times higher than the controlled CO emission factor actually used in the application. The application also provides test results from Glacial Lakes, which indicate controlled indicating a CO emission factor of 1.21 lbs/ton of dry feed. This is also far higher than the factor used in calculating CO emissions. Use of these higher factors yields significantly higher emissions, making the plant a major source for CO. There would be no physical limit on dryer throughput to restrict the potential emissions to less than 100 tons of CO per year.

The application does not provide any specific details as to the steam tube dryer operations, such as tested uncontrolled emission rates at other plants or process information on the operation of such dryers.
The consultant who prepared the application has provided a factor of 0.465 lbs CO/ton of dry feed in another current permit application, which relies upon 95% control for CO. In the absence of substantial justification for the claimed CO emission factor for the dryer, the application must be considered incomplete. Alternatively, a permit cannot be issued because of the information indicating CO emissions above the major source threshold.

As is apparent from these comments, if uncontrolled CO emissions from the feed dryers are 2.0 lbs/ton of dry feed or higher, the thermal oxidizers at the proposed plant will have to be operated to achieve greater than 90% control to meet the limits on CO emissions proposed in the application and carries over into the permit. In this regard, the 90% control requirement in the permit is a minimum requirement for the performance of the oxidizers, independent of the level of CO emissions generated by the dryers. The thermal oxidizers must also be operated to comply with the hourly CO limit specified by the permit, 5.28 lb/hr. As previously explained, oxidizers can be operated over a range of efficiencies.

97. Condition 2.6.6(a)(i) requires the oxidizer to achieve 98% control efficiency for VOM or reduce VOM emissions to no more than 10 ppmv, whichever is less stringent. Similarly, Condition 2.6.6(a)(ii) requires a 90% control efficiency for CO or a concentration of no more than 100 ppmv, whichever is less stringent. These concentration limits are not properly enforceable and are inappropriate in the absence of a specific oxygen or carbon dioxide correction factor.

Emission limits expressed in terms of actual stack gas concentration, without "correction factors," as established in this comment, are fully enforceable. While correction factors are commonly used when setting concentration-type limits for boilers and incinerators, this is not the case for process units like the feed dryers and other VOM process units that are being controlled by the oxidizers.

98. The VOM and CO limits in for the feed dryers in Conditions 2.6.6(a)(i) and (ii) do not properly limit the potential emissions of the dryers through physical limits on the process or production rate in order to ensure that both the hourly and annual time rate of mass emission limit will be achieved. At a very minimum, the permit must limit dry feed production to no more than 356,880 tons per year

As explained in response to other comments, these conditions contain operational limits that, together with other limits in the permit, act to limit the potential emissions of the feed dryers and other units controlled by the oxidizers. In addition, the issued permit does include a limit on the total feed production by the plant. To address the different types of feed that can be produced by the plant, the condition provides that production of wet cake or modified wet cake would be expressed in terms of the equivalent amount of dry feed.

99. The permit must also limit the amount of natural gas fired in the oxidizers to a level consistent with the information in the application. Limits on natural gas usage for the

entire plant cannot effectively limit emissions when different units have different emission rates on a pound per SCF or million Btu basis.

The issued permit limits the usage of natural gas in the oxidizers. This action has taken because the natural gas usage by the oxidizers, as indicated in the application, is significantly less than the potential usage of natural gas in the oxidizers, as would be calculated from the rated heat input capacity of the burners in the oxidizers.

100. There is no demonstration that compliance with the CO and VOM concentration limits will also support compliance with the hourly emission limits for CO and VOM. The application indicates that the exhaust flow rate of each oxidizer is 87,000 SCFM. However, the application also states that the capacity of the fuel burner in each oxidizer is 122 million Btu/hr. This suggests that the 87,000 SCFM exhaust rates are associated with the larger fuel rate units which are inconsistently shown in the application. This 122 million Btu/hr fuel rate is inconsistent with other information in the application showing fuel rates of each of the oxidizers limited to 10 million Btu/hr. A permit must not be approved while having such inconsistent, unreliable and contradictory information in the application. There should be no rush to permit a plant when an applicant cobbles together elements of the application from other plants to create a hybridized construction permit application. All such inconsistent and contradictory information must be corrected so the application describes the actual equipment for which a permit is being requested.

The application does not provide inconsistent or contradictory information for the oxidizers, as suggested by this comment. The exhaust flow rate out of the feed dryers is determined by the amount of drying air blown into the dryers, which is independent of the capacity of the burners in the oxidizers. The oxidizers control the exhausts from the dryers, such as they are. The firing of the burners, with introduction of natural gas and primary combustion air will contribute some additional flow to the exhaust stream, so that the volume of exhaust leaving the oxidizers will be somewhat greater than the volume of exhaust that entered the oxidizers from the dryers. The amount of his additional volume will depend on how hard the oxidizer burner is being fired. This will further depend largely on whether the oxidizer has reached thermal equilibrium or is still heating the refractory beds used for thermal efficiency. If in equilibrium, steady-state mode, the firing rate of the oxidizer will be much less than if in pre-heat mode.

The application may appear contradictory if one does not distinguish between the rated capacity and actual firing rate of the burners in the oxidizers. The capacity of each burner is significantly greater than the normal rate at which the burner is fired. This "additional capacity" is needed for startup and shutdown of a dryer/oxidizer system, but is otherwise not normally utilized. For the oxidizers at the proposed plant, the actual firing rate of each oxidizer, as would accompany during normal operation of the oxidizer, should not exceed 10 million Btu/hour, as was stated in the application. The rated capacity of the burners will be about twice this, no more than 20 million Btu/hour. In this regard, the original application did include incorrect information about the size of the burner in each oxidizer, which Marquis has subsequently corrected.

The natural gas firing rate of the burners in the oxidizers is a relevant factor for the NOx emissions created by the oxidizers. It is not of particular concern for CO and VOM emissions, the majority of which are generated in the process units that are being controlled by the oxidizer. In addition, the concentration limits in the permit for CO and VOM emissions from the dryer/oxidizer systems are not intended to have the same effect or "mirror" the hourly emission limits for CO or VOM. As already explained, the permit contains limits that restrict the amount of emissions from units at the plant and requirements for the performance of associated control devices.

101. The actual heat input to the oxidizers is not limited by Condition 2.6.5(a)(ii) of the draft permit. The use of the word "capacity" makes this condition as a design limit rather than an operational or production rate limit. The condition should limit the actual heat input, rather than just the "capacity." The Permit should also include operating limits on either wet feed in or dry feed out of the dryer.

The issued permit includes limits on the actual usage of natural gas by the oxidizers. These limits were developed from information provided in the application for the actual usage of natural gas by the oxidizers, as related to emissions of NOx, which will largely be generated by the burners in the oxidizers. Since a limit on natural gas usage is included in the issued permit, the emission limit for NOx is not expressed in terms of lbs/million Btu heat input, rather than lbs/hr, as proposed in the draft permit.

It is not necessary to include a limit on the amount of feed handled by the dryers. This is because the emissions calculations for feed drying conservatively assume that all feed is dried. In addition, the amount of wet material that is available to be dried is related to the amount of grain processed by the plant, which is limited.

102. The design drawing for the thermal oxidizers submitted in the application shows a small transfer line from the natural gas main to the larger waste gas line before entry to the oxidizer. The emission calculations presented in the application do not address the emission consequences or purpose of this line, which is labeled "assist gas." This is clearly a route for introducing natural gas to the oxidizer that is separate and distinct from the natural gas line to the burner. A permit should not be issued unless the purpose and emission consequences of the "assist gas" line are fully explained to ensure that "assist gas" added to the waste gas feed to the oxidizers are properly subjected to monitoring and review as to impact on emissions and throughput of the oxidizers.

As suggested by its name, the "assist gas" line allows natural gas to be added to the waste gas sent to the oxidizers, which comes from certain mash preparation units and the distillation units, and enhances the heat content of this gas. The function of the natural gas would be to facilitate combustion of the waste gas in the oxidizer and the assist gas would be burned with the waste gas. Thus it is not necessary to consider assist gas as part of the burner capacity of the oxidizers.

103. The application indicates that the SO_2 emission calculations for the proposed plant are based on emissions testing at Glacial Lakes, but test results were not included in the application. The draft permit does not include any compliance monitoring for SO_2

emission. At the very least, the thermal oxidizers should be subject to initial emissions testing for SO_2 and additional emissions or parameter monitoring to ensure compliance.

Marquis has submitted the results of the SO_2 emission testing at Glacial Lakes, which show SO_2 emission of 0.17 lbs/ton of dry feed. The SO2 emission calculations for the proposed plant were conservatively performed using an SO2 emission factor of 0.45 lbs/ton. The issued permit requires emissions testing for SO_2 emissions from the dryer/oxidizer systems. Recordkeeping is required for use of sulfuric acid in the fermentation process, which was identified in the application as the source or origin for SO_2 emissions during feed drying.

104. For the thermal oxidizers, the permit should require continuous monitoring for flue gas oxygen concentration and flow rate, as well as combustion temperature. Monitoring of these two additional parameters is required to verify proper combustion conditions and confirm compliance with hourly emission limits. The monitoring required for these parameters should include numerical tolerances on the accuracy of the measuring devices, requirements for testing to verify accuracy and the specification of required standards (such as from ASTM) for quality assurance/quality control testing. These provisions should not simply rely on a "manufacturer's recommendations." Reliance on "manufacturer's recommendations" is too vague to be enforceable in practice.

For afterburners, like the thermal oxidizers at the proposed plant, operational monitoring of combustion chamber temperature is generally sufficient to confirm proper operation for effective combustion. Additional operational monitoring, as suggested by this comment, is only considered if specific circumstances are present, e.g., low oxygen content in the exhaust stream from the process stream or an afterburner whose capacity is not sufficient if all process units served by the device are being operated. These circumstances are not present for the oxidizers at the proposed plant.

105. Condition 2.6.8(d)(ii) in the draft permit is subject to interpretation because the temperature scale is not specified and there is no standard (such as ASTM procedure)indicated for verifying the accuracy of the measurement device.

In the issued permit, provisions related to temperature are expressed in Fahrenheit (ºF), so as to define other requirements of the permit related to such temperatures. If the plant elects to keep records using another temperature scale, the plant would have to appropriately implement requirements related to temperature so s to achieve at least equivalent results, as if temperatures were measured in ºF . As previously explained, it is not necessary to specify a measurement protocol for temperature measurements.

106. For other parametric monitoring, such as the damper provisions in Condition 2.6.8, every monitored parameter should invoke recordkeeping to ensure that such data is available for enforcement purposes. In addition, for all parametric monitoring devices, each such monitoring indication that will be relied upon for ensuring compliance must feature a method by which the variance in a monitored parameter can be associated with a threshold for noncompliant operation of a unit.

The issued permit specifies that records must be kept of the data measured by required monitoring devices and instrumentation. (See Condition 1.4 of the permit.) The permit also specifies that certain "key" operating parameters will be used as direct indicators of compliant operation for specific control devices, with acceptable values or ranges of those parameters based on the values of the operating parameter during emissions testing. However, it is not necessary for all operating parameters for which monitoring or instrumentation is required to be treated in such manner. Monitoring or instrumentation of operating parameters can also be required to collect data that can be used to document the plant's operating practices and generally facilitate ongoing review of plant operation by the Illinois EPA.

107. The permit should require all emission testing to be done at maximum process rates. In addition, further test conditions during a series of emissions tests should also show compliance with VOM and CO control requirements, stack gas concentration and percentage reduction requirements at the lowest oxidizer heat input rate for the unit that is expected in regular operations.

As already explained, emissions testing must be performed at levels that reasonably represent the maximum operating rate or production rate of process equipment.

108. For any limit expressed in lb/million Btu, this plant will pose special and complex problems if compliance monitoring relies on "F factors" developed by USEPA. The introduction of the dryer gases in addition to natural gas combustion means that natural gas F factors cannot be used. There must be a clear and Illinois EPA approved procedure for determining F factors for compliance purposes at this plant.

As noted by this comment, F Factors will not be able to be used to address compliance with the short-term NOx limit for the dryer/oxidizer systems.

109. While the draft permit limits the amount of natural gas used at the plant, it would not require that that natural gas usage be monitored continuously, either for the plant or for specific units. The permit should require monitoring of natural gas usage on at least an hourly basis, along with recordkeeping and reporting requirements related to natural gas combustion. When combustion units have different emissions per unit of gas combusted, each unit should have a specific natural gas combustion monitoring requirement.

The draft permit required instrumentation for the natural gas usage by each boiler. In addition, the issued permit also requires instrumentation for natural gas usage by the thermal oxidizers. This requirement has been included in the issued permit because the emission calculations for the oxidizers and the resulting emission limits for NOx are based on the oxidizers routinely operating with the burners firing at a rate that is much less than the rated heat input capacity of the burners.

110. The recordkeeping for natural gas usage should be sufficiently detailed to determine hourly emissions from each natural gas combustion unit each hour of the year. The permit should provide for natural gas flow monitors with accuracy determined according to a known national standard as an enforceable permit condition.

The monitoring requested for combustion units by this comment is not justified. Hourly monitoring of natural gas usage is not required to assure that a combustion unit is being properly operated.

111. Compliance with the maximum hourly emission rate cannot be made through using a 30 day running average on mass emissions per unit of heat input. The permit must ensure that the hourly emission limit is met every hour by each emission unit.

The permit does not address compliance with short-term limits using a 30-day average as suggested by this comment. However, it would not be inappropriate to do so for a combustion unit that was equipped with continuous emissions monitoring, so as to allow such a determination to be made. Where the permit establishes short-term limits on the emissions from a unit, the permit includes appropriate testing, monitoring and recordkeeping requirements to verify compliance with such limits.

112. The oxidizers should be subject to continuous emission monitoring for NOx and CO, using QA/QC protocols similar to those found in the NSPS, 40 CFR Part 60, Subpart A. Continuous emission monitoring would ensure that the plant emissions of NOX and CO are below the major source thresholds. Given the small margins below the major source thresholds, continuous monitoring is the only means by which the plant can ensure that it does not cross such thresholds.

For the oxidizers, continuous emissions monitoring for NOx is not appropriate, since the permitted emissions of NOx from the oxidizers are less than 10 percent of the plant's permitted emissions of NOx. However, the permitted emissions of CO from the oxidizers are about 50% of the plant's permitted emissions of CO. Accordingly, the issued permit would generally require a continuous emissions monitor for CO emissions to be installed and operated on the stack from the oxidizers if CO emissions as measured during testing are not well below the applicable limit, i.e., no more than 80% of the limit. In the event that such monitoring would be required, monitoring would have to be conducted in accordance with all relevant protocols for continuous emissions monitoring under 40 CFR Part 60. Consistent with 40 CFR 60, with an appropriate demonstration by the plant, a parametric monitoring, in accordance with a parametric monitoring plan approved by the Illinois EPA, could eventually substitute for continuous emissions monitoring for CO.

113. Condition 2.6.9(a)(ii) and (iii) discuss monthly recordkeeping on feed production and natural gas usage, but where compliance requirements and limits on emissions go to hourly emission limits, hourly data integration is essential to assure compliance with annual limits.

The permit requires that all relevant emission data be compiled when verifying compliance with annual emission limits. For this purpose, it is expected that for many emission units this would entail determining emissions as if the unit and associated control device operated normally at all times and combining this "base value" with specific data to account for any additional emissions that occurred in any periods when the unit did not operate normally. Accordingly, the determination of emissions would not require detailed

information for periods of normal operation, as shown by relevant operational records, when the emissions would be adequately addressed by the emission factors for normal operation. For units and pollutants for which emissions monitoring is conducted, hour-by-hour emission data would be appropriately used to verify compliance with annual limits.

114. Condition 2.6 does not contain compliance procedure for NOx limits.

To address the short-term limit for NOx emissions from the oxidizers, 0.1 lbs/million Btu, the issued permit requires emissions testing and recordkeeping to address proper operation and maintenance of the oxidizer. These practices are adequate, given numerical value of the NOx limit.

Package Boiler (Condition 2.1)

115. What does Condition 2.1.8(d), which states "Following the shakedown period, NOx continuous emission monitoring on the boilers may be discontinued if a parametric monitoring plan is approved by the Illinois EPA," mean?

This condition reflects provisions of the relevant federal rules, 40 CFR 60, Subpart Db, as they govern the NOx emissions of the boilers at the proposed plant. These rules require that the NOx emissions from each boiler be continuously monitored. However, this monitoring may be performed either directly, with an instrument that measures the concentration of NOx in the boiler stack, or indirectly, with parametric monitoring, by monitoring appropriate boiler operating parameters to allow NOx emissions to be calculated. This indirect approach to monitoring is set forth in a parametric monitoring plan, which is prepared by the source and, for units in Illinois, must be approved by the Illinois EPA. If a source elects to pursue development of a parametric monitoring plan, the source must continue to directly monitor emissions until the plan is approved. A plan can only be approved if the source demonstrates that there is a consistent relationship between certain operating parameters of the boiler, such as load and oxygen concentration in the flue gas, and NOx emissions, so that NOx emissions can be reliably determined with operational monitoring of the boiler.

116. The permit should not allow continuous emissions monitoring for NOx and CO to be discontinued. The emission factors used for the boiler for NOx and CO are below the applicable USEPA factor in AP-42. If a control device is needed to assure compliance with emission limits, continuous emission monitoring should be required to assure continuous compliance.

As already explained, the provisions of the permit for monitoring of NOx from the package boilers reflect provisions of the federal NSPS. Similar principles apply for emissions of CO. If emissions of CO can be reasonably determined with operational monitoring, operational monitoring should be accepted in lieu of continuing with continuous emissions monitoring, particularly as approval of operational monitoring may require routine operation of a unit with a greater margin of compliance from applicable limits and standards.

The presence of a control device on a unit is only one factor that should be considered when deciding whether continuous emissions monitoring is appropriate. Other relevant factors include matters such as the type of unit, the type of control device, the applicable limit or standard, the expected actual emission rate, the size of the unit, and compliance procedures other than emissions monitoring that can be implemented for the unit.

117. The operating ranges for combustion temperature and oxygen in the oxidizers must reflect evaluation of continuous monitoring for both NOx and CO, since simultaneous compliance with both requirements will increase one pollutant while decreasing another.

While the oxidizers must simultaneously comply with applicable limits for NOx and CO, this does not pose special concerns. Unless otherwise provided by a specific standard or limit, all emission units must simultaneously comply with all applicable requirements and limits. This is routinely considered when emissions calculations are performed for a unit that emits both NOx and CO, as a set of emission factors is used that can both be met simultaneously. If the factor for either pollutant is adjusted, the effect of the adjustment is considered with revised emission calculations for the other pollutant. As a result, the limits that are eventually set for a unit should be such that both limits can be met and they are not mutually exclusive.

118. Continuous monitoring recordkeeping and reporting provisions in Condition 2.1.9 should include "out of control" periods on monitoring as defined by federal continuous monitoring QA/QC regulations in 40 CFR Part 60, Subpart A.

The issued permit specifies that the Permittee must operate all required continuous emissions monitors in accordance with relevant NSPS requirements, as recommended by this comment.

119. The draft permit does not appear to contain a compliance determination method that ensures compliance with hourly mass emission limits applicable to the package boilers. Condition 2.1.9(b)(iii) does not ensure compliance with the maximum hourly rate since it is written to address "average hourly NOx emission rates" in lbs/million Btu. Compliance with hourly emission limits cannot be made on the basis of calculations from a 30 day rolling average on pounds of emissions per million Btu. Neither can compliance with maximum hourly emission limits be determined from daily monitoring and recordkeeping of natural gas usage. Condition 2.1.9(g) cannot ensure compliance with the maximum hourly emission limits.

For the package boilers, the permit relies on the compliance procedures of the federal NSPS to determine compliance with NOx limits. This has been clarified in the issued permit. In this regard, as the package boilers are subject to the NSPS and it requires continuous emissions monitoring for NOx, it is appropriate to allow compliance with NOx limits to be determined on a 30-day rolling average, building upon the structure provided by the NSPS. This provides a daily determination of compliance for each boiler.

120. The recordkeeping of Condition 2.1.9(b)(ii) cannot ensure compliance with the hourly emission limits and the requirement to limit heat input to 245 million Btu/hour because it

only imposes recordkeeping for the amount of natural gas combusted per day. Daily average calculations cannot ensure compliance with maximum hourly emission limits.

As explained above, for the package boilers, compliance with the short-term NOx emission limits has been tied to the NSPS compliance procedures. The capacity of the boilers is separately addressed by Condition 2.1.5, which establishes a limit on the physical capacity of each boiler.

121. While the application uses emission factors of 0.04 and 0.02 lb/million Btu for NOx and CO, respectively, for the two package boilers, and these factors were relied upon to determine both hourly and annual emission rates for the boilers, the draft permit does not include provisions to ensure that these emission rates will be actually achieved for every hour of the year. This is not acceptable from the standpoint of ensuring compliance with NOx and CO emissions limits.

As explained above, for emissions of NOx, the issued permit does not require compliance with emission limits on an hour-by-hour basis. Instead compliance is required on a daily basis, with NOx emissions determined from an average of 30 operating days, as provided by the NSPS. Compliance with the CO limits is addressed by recordkeeping for proper operation and maintenance of the package boilers. The permit also includes provisions requiring the plant to conduct continuous emissions monitoring for CO if needed to provide further assurance of compliance, in the event emission testing shows that there is not a substantial compliance margin with the short-term CO limit.

122. Condition 2.5.10 on reporting does not appear to require a complete protocol/suite of traditional continuous monitoring quarterly reports. The reporting provisions should be considerably more robust, indicating that continuous monitoring reports for NOX and CO be submitted quarterly and that such reports contain information for any emission violations and their causes, information for monitor downtime and its causes, summaries for both emission violations and monitor downtime as a percentage of unit operating time, and other traditional measures. Similarly, for required parametric monitoring, reports, the permits should clearly require reports that included summaries of applicable data and information on accuracy testing, parameter exception periods, monitor downtime.

As previously explained, continuous emissions monitoring must be conducted in accordance with relevant monitoring requirements of the federal NSPS, included detailed reporting of information as addressed by this comment.

Feed Cooler (Condition 4.6)

123. For the feed cooler, additional condensible PM, which was not considered in the application, could push the plant over the 100 ton/year major source threshold. The feed cooler, has the potential for continued thermal generation of emissions, because of the elevated temperature of the dried feed entering the cooler. These emissions can be expected to include condensible PM, but emissions from the feed cooler were calculated solely as filterable PM, based on the guaranteed baghouse performance of 0.005 gr/scf.

At the VeraSun plant in Fort Dodge, Iowa (a 110 million gallon/year plant), emissions testing of the feed cooler bypass, showed most of the PM emissions were condensible PM (0.016 and 0.128 lb/hr for filterable and condensible PM, respectively) or potential emissions of 0.56 ton/yr from a feed cooler that discharges only a portion of its exhaust to the atmosphere. In the case of the feed cooler at the proposed plant, the entire exhaust is vented to the atmosphere.

The test data from VeraSun confirms the conservative nature of the emissions calculations in the application for the proposed plant. The exhaust volume from the feed cooler at VeraSun is about one 40 percent of the volume of the exhaust from the feed cooler at the proposed plant (12,000 scfm compared to 28,000 scfm). Accordingly, appropriately adjusting for the difference in the exhaust volume, the testing at VeraSun indicates that the actual PM emissions of the feed cooler at the proposed plant would be 1.4 tons/yr. The application for the proposed permit accounts for and the permit limits PM emissions from the proposed feed cooler to 9.4 tons/yr.

124. The plant process flow diagram shows a series of conveyers for the feed dryers and the feed cooler. The application does not show that these conveyors will be controlled. Like the feed cooler, these conveyors have the potential for emissions. However, there is no consideration of VOM, PM or CO emissions from these units in the overall emission calculations. Without this information, the application is incomplete.

Marquis has confirmed that these conveyors will be controlled by the feed cooler baghouse and the emissions of these conveyors are addressed with the emission calculations for the feed cooler.

125. The application does not address the emission implications of wastewater collected in the knockout drum and its subsequent handling. The knockout drum reduces PM emissions from the oxidizers associated with liquids and aerosols entrained in the waste gas.

As indicated in the comment, the knockout drum removes entrained liquids from a gas stream that is controlled by the thermal oxidizers. These liquids are then reused as condensate for the boiler. Since the knockout drum eventually "vents" its gas stream to an oxidizer, it is not reasonable to expect emissions from this unit of from the subsequent handling of the water stream collected by this unit. Marquis has confirmed that the water stream from the knockout drum would not be a source of emissions, as it would be routed back to the boilers for use as feedwater.

4.6.6 Wet Cake Storage

126. The application does not contain any justification for the VOM emission rates for the wet cake outdoor loading pads

Marquis has submitted the detailed report for the emission testing for wet cake conducted by the Natural Resources Group, Inc.

127. Condition 2.6.6(e)(i) should limit hourly emissions from load-out of wet cake, rather than monthly emissions.

The permit intentionally limits emissions from load-out of wet cake on a monthly basis. This is because load-out of wet cake would not occur on a continuous basis. It would only occur if and as there were a market for wet cake from the plant, with shipments of wet cake most likely occurring by truck.

Cooling Tower (Condition 2.11)

128. To assure compliance with applicable emission limits for the cooling tower, the permit must require monitoring and periodic inspections of the cooling tower. The permit should also require monthly monitoring of the total dissolved solids (TDS) content of the circulating cooling water to ensure that the TDS content does not exceed 2500 ppm. The tower must also be subject to a requirement that the TDS content of the cooling water does not exceed 2500 ppm.

The issued permit includes additional requirements for the cooling tower, as generally recommended by this comment.

129. The permit should require quarterly measurements of the ethanol content of cooling water, measured at a point in the distillation area directly downstream of the condensers. This is needed to verify that that the condensers are not leaking, due to corrosion or other degradation.

It is not appropriate for the construction permit for the proposed plant to mandate specific requirements of the type suggested in this comment. In the absence of actual experience at a specific plant demonstrating failure to properly implement particular maintenance practices, a permit is issued based upon the presumption that all equipment will be properly maintained and repaired as necessary to prevent or promptly correct failures that would lead to increased emissions, such as the equipment failures described in this comment. This includes not only maintaining the integrity of heat exchangers, but also maintaining the integrity of other features at a plant, including enclosures, tanks, ductwork, fans, and stacks.

130. The permit should prohibit any introduction of any kind of any process water into the cooling water that circulates through the cooling tower

The issued permit prohibits intentional introduction of process water into the cooling water and requires that any leaks be promptly repaired.

Bio-methanator (Condition 2.10)

131. The permit should limit the operation of the biomethanator flare to no more than 4380 hours per year to support the emission calculations.

It is not appropriate to limit the operation of the biomethanator flare as requested by this comment. This is because the flare serves as a safety device, for disposal of biogas when it cannot be used as fuel. In addition, as the preferred disposition of biogas is use as fuel at the plant, any "extra" flaring of biogas would only occur due to major interruptions in the other operations at the plant, which would be accompanied by a net reduction in emissions from the plant.

132. For the biomethanator flare, the application started from the VOM emission factor from AP-42, 0.14 lbs of total organic carbon (TOC) per million Btu, and adjusted the factor based on the methane and ethane content of the flared gas (63%). This reduced the emission factor to 0.052 lb VOM/million Btu, which was then used to calculate VOM emission from the flare. This adjustment was made on an assumption that only regulated VOM should be considered in the VOM emissions of the flare.

    This approach is flawed. It underestimates VOM emissions from this flare because it takes full credit for what USEPA indicated in AP-42 was 8 volume percent emissions of ethane/ethylene, but ethylene is a VOM. Further, ethane is not a likely product of incomplete combustion of ethanol vapors because of the presence of oxygen and its position in the ethanol molecule. The VOM emissions of this flare should be recalculated using the AP42 factor without any adjustment.

Adjustment to the AP-42 factor for flare emissions is required because AP-42 provides an emission factor, as cited above, in terms of total hydrocarbons (THC). Moreover it is appropriate that this adjustment should be of the magnitude made in the application. This is because the function of the biomethanator process is to produce a methane-rich fuel quality gas from the organic material in certain process wastewater streams. It is this methane-rich gas that is being flared, not ethanol vapors.

133. The application did not show any PM emissions from the biomethanator flare but the draft permit shows 0.44 tons/year of PM. The application did not account for condensible PM emissions from other flares.

As noted in the comment, the Illinois EPA accounted for the PM emissions from the flare, assuming potential PM emissions of 0.44 tons/year, including both filterable and condensible PM. This value is adequate, as "smokeless flares," as required at the proposed plant have not been identified as significant sources of PM emissions.

Roadway Emissions (Condition 2.12)

134. When calculating potential PM emissions from the roadways at the proposed plant, the application used a silt loading factor of 0.4 gram/meter^2, which yielded potential PM emissions of 33.74 tons/yr. However, the use of a factor of 0.4 gram/meter^2 for the average silt loading on roadways at an industrial plant is not correct and is not supported by AP-42, as incorrectly claimed in the application. Even if plant roadways were public roads, the lowest silt loading provided by USEPA in AP-42 as the "ubiquitous baseline" for public roads with less than 500 average daily traffic volume is 0.6 gram/meter^2. This factor is also subject to multipliers during the winter if roads are treated for anti-skidding.

Calculation of roadway emissions for the proposed plant, using a silt loading of 0.6 gram/meter^2 and all other factors being the same, yields potential PM emissions of 43.9 tons/year from the plant, which would make the plant a major source for PM emissions.

The issued permit requires that measurements be conducted for the silt loading on roadways at the plant. These measurements, together with other provisions of the permit, should assure that the PM emissions of roadways at the plant are appropriately controlled so as to maintain PM emissions with the limits set by the permit. In this regard, the roadways at the plant are not public roads and will be subject to requirements for regular sweeping, flushing or other dust control measure to minimize dust emissions.

135. Use of a silt loading of 0.4 gram/meter^2 also is not supported by actual experience. A review of the data for silt loading used for other grain processing plants and the permitting practices of other Midwestern states shows roadway silt loadings that range from 0.5 to 7.4 gram/meter^2. This review shows that the 0.4 gram/meter^2 silt loading used for the proposed plant is too low.

The material provided with this comment confirms the need for measurement of the actual silt loadings on plant roadways, as required by the issued permit.

136. The draft permit does not contains measures that will ensure that the 0.4 gram/meter^2 silt loading and the associated limit on PM emissions from roadways will actually be met. There are no specific requirements for periodic sweeping and cleaning of roadways that would allow such a level of silt loading to be achieved. Mere reliance on a future plan, with applicant-discretionary measures that are not enforceable in practice, cannot ensure compliance with the associated emission limit. At a minimum, if a permit is issued based on a silt loading of 0.4 gram/meter^2, the permit must require that such silt loading be achieved in practice, together with quarterly testing requirements.

The issued permit includes additional requirements for the fugitive dust control program to assure that program developed by the plant includes emission control measures that should assure that associated limits on PM emissions are met. Given the variety of control measures that could be used by the plant, for a plant that has not even been constructed, it is not appropriate for the permit to specify specific measure that must be used to control PM emissions from roadways.

137. Without a clear physical limit on the potential to emit, achievement of the emission limit in the draft permit for roadways cannot be ensured. The emission calculations assumes 30% of alcohol shipments and 50% of dry feed shipments will be by truck. However, the permit does not guarantee that truck traffic will not exceed these levels. The permit should include limits on annual truck VMT, reflecting the assumptions underlying the PM emissions calculations for the plant.

The application conservatively, i.e., generously, accounted for the truck traffic at the proposed plant when calculating PM emissions of roadways. Accordingly, it is not necessary to explicitly limit the amount of truck traffic. The amount of truck traffic is adequately restricted by explicit limits on the overall receipts of grain and production of

ethanol by the plant and by the physical location of the plant, which restricts the amount of material that can transported be truck.

Other Provisions of the Permit

138. The plant can be expected to have natural gas fired space heating units in various building. Although these units may be exempt from permitting, they still count towards the total emissions of the plant for comparison with the major source threshold. Applicant must disclose the total emissions associated with such space heating units as part of a complete application.

The usage of natural gas by space heating units at the plant is addressed by the permit, as the permit limits total usage of natural gas by the plant and the total emissions of different pollutants from the plant.

139. Emission limits in Table I of the draft permit for certain units are slightly different that the emissions calculated in the application. For example, the application shows 32.74 tons PM /yr for roadways, but Table I shows 32.42 tons/yr, a difference of 0.3 tons/yr.

These differences reflect downward adjustments of the emissions of certain units that occurred during the review of the application by the Illinois EPA. The issued permit further reduces the permitted emissions of certain units, based on the further review of the application that was conducted by the Illinois EPA in response to public comments.

FOR ADDITIONAL INFORMATION

Questions about the public comment period and permit decision should be directed to:

Bradley Frost, Community Relations Coordinator
Illinois Environmental Protection Agency
Office of Community Relations
1021 North Grand Avenue, East
P.O. Box 19506
Springfield, Illinois 62794-9506

217-782-7027 Desk line 217-782-9143 TDD 217-524-5023 Facsimile

brad.frost@epa.state.il.us